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EXPLORATION AND DIVISION OF THE FEMORAL AND ILIAC VEINS IN THE TREATMENT OF THROMBOPHLEBITIS OF THE LEG*

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EXPLORATION of the femoral and iliac veins has been found useful in treating some of the varieties of thrombophlebitis peculiar to the leg. As in other comparatively untried procedures, its indications are not as yet clear. The radical surgeon will use it too often; the conservative, too seldom. Its principal indication is undoubtedly to prevent pulmonary embolism, but it may be called for to correct peripheral vasospasm in the limb served by the diseased vein, to oppose recurrence of attacks of femoroiliac thrombophlebitis and, conceivably, once the femoral vein has suffered destruction of its valves by earlier attacks, to prevent backflow down the vein, the same purpose for which a varicose vein is divided at the groin. No other indications, however, can compare in importance with preventing the detachment of an embolus. And the most frequent source of embolism, in my opinion, is the so-called "bland" type of thrombosis, especially the sort that originates in the deep veins below the knee.

THROMBOPHLEBITIS IN THE DEEP VEINS OF THE LOWER LEG

Occurring During Active Life

In 1934, I[1] read a paper before this society on "Thrombosis of the Deep Veins of the Lower Leg, Causing Pulmonary Embolism," based on four cases, in one of which (A.F., 1929) I successfully divided the superficial femoral vein at the groin. This operation was performed at the request of Dr. Channing Frothingham, who had seen another of his patients die, without operation, under exactly similar conditions of disease. Since that time, I have treated five other patients, not one of whom has suffered a pulmonary embolism, and two of whom I have operated on with success. For the sake of clarity, let it be understood that I am alluding, for the moment, only to thrombophlebitis in the deep veins of the calf, occurring during active life; that pulmonary embolism has been held in each case to be threatened; that treatment has been directed principally against that accident; that the patients were young or middle-aged, and free from antecedent disease; and that the diagnosis rests on the following findings: the patient experiences lameness on walking, especially when going up or down stairs; such swelling and cyanosis as are present are confined to the lower leg, that is, entirely below the thigh; there is no generalized edema as in phlegmasia alba dolens; *the dorsiflexion sign* — discomfort behind the knee on forced dorsiflexion of the foot — *is positive;* swelling and cyanosis are always relieved by a few days' rest in bed (in contrast to femoroiliac thrombophlebitis), and in several cases, ineffectually treated, have recurred more than once.

The treatment consists of rest in bed, the foot of which is elevated from 10 to 15 cm. The leg is sometimes placed on a small, soft pillow for comfort, but is otherwise left free. The active venous return so secured is believed to limit the progress of thrombosis and to lead to healing. The swelling and cyanosis, if any, always disappear in a few days, but the dorsiflexion sign usually lasts for a week or more. At the end of ten days, all signs of disease having gone, the leg is actively used in bed, the foot being exercised first, then the knee and thigh, as in riding a bicycle. After four days of this treatment the leg is bandaged from toes to knee with semielastic cotton bandage, and the patient begins to walk. If none of the original signs recur, he is allowed, about three weeks from the time he went to bed, to resume a full, active existence.

If, on the other hand, when the patient first gets up, the discomfort, edema and especially the

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dorsiflexion sign reappear, the superficial femoral vein is at once exposed and divided. Operation is recommended also when the patient, before being seen, has already undergone several episodes of bed rest and relapse.

A case in point, fairly representative of the three that I have treated by operation, is the following:

S. G., a healthy 18-year-old college girl, had recently driven an automobile across the continent. On arriving, she felt her right leg to be lame, and after a day or two I found her ankle to be slightly swollen, the foot faintly cyanotic. The dorsiflexion sign was strongly positive. After 2 weeks of treatment by elevation of the leg in bed, she seemed to have fully recovered and was allowed gradually to get about in a semielastic cotton bandage. Almost at once, however, the lameness and swelling reappeared and discomfort on dorsiflexion recurred. Accordingly, the superficial femoral vein at the groin was explored, was found to contain no clot at this level and was divided. After a week in bed and a second week of convalescence, the girl was able to ignore the leg, which never again exhibited lameness or swelling.

Thus the division, primarily intended to forestall embolism, rapidly and permanently relieved the patient of all signs of the disease. Such an optimistic statement is justified by exactly similar results in two other cases, one, a woman of thirty-five, the other, an athletic man of forty-five. It will be understood, of course, that three other patients recovered completely, without operation, under the scheme of treatment outlined.

All this I[1-3] have already described in other writings. Accordingly, I go on to another and more difficult phase of thrombosis of the deep veins of the lower leg, namely, that which occurs during an illness, or postoperatively, or in the course of life in bed enforced by any posttraumatic state. Under these conditions, the patient being already horizontal and the femoral and iliac veins being unobstructed, *no swelling or cyanosis occurs,* and pain below the knee is slight or altogether absent.

Occurring During Life In Bed

Since thrombophlebitis occurring during life in bed causes few and unreliable subjective signs, it is often unnoticed until an embolism occurs. A sufficiently typical case will serve to describe it.

M. A. H., a 54-year-old woman, was operated on for gallstones and chronic cholecystitis. The operation and early days of convalescence were as uneventful as possible, but on the morning of the 8th day the patient complained of extreme shortness of breath and pain in the midchest. From this attack she recovered in the course of the day, the electrocardiogram showing no sign of coronary infarction.

Both lower limbs appeared completely normal: there was no cyanosis or swelling, and no tenderness. However, forced dorsiflexion of the feet brought out a slight but distinct discomfort in the back of the right upper calf. This was taken to be sufficient evidence of a deep thrombosis in some of the great venous plexuses of the calf—short perhaps of a venogram, which appeared dangerous under the circumstances.

Exploration of the femoral vein was made after the method presently to be described. When exposed, the superficial and common femoral veins appeared normal, but when the superficial femoral vein was opened, just distal to the profunda, there was found floating in the current the free proximal end of a thrombus, whose attachment must have been to a vessel in the upper calf or popliteal space. The upper part of this soft thrombus, from which the recent embolus is presumed to have broken, was sucked out, and the vein divided between ligatures. The patient made an uneventful recovery. The leg gave no trouble during convalescence or afterward.

That this sort of accident is not unusual requires no proof, although a warning embolism causing infarction does not by any means regularly precede the fatal breaking off of the long propagating thrombus. However, it is of some interest that, subsequently, this woman's brother, while under treatment for a neglected appendicitis, died of a pulmonary embolism. The autopsy disclosed the parent thrombosis in a plexus of veins between the gastrocnemius and soleus muscles, and a study of the lungs showed that a pulmonary infarction had preceded the fatal embolism. Possibly, a more suspicious and watchful attitude might have identified the warning infarct and even called attention to the guilty leg.

NONOBSTRUCTING BLAND THROMBOSIS IN THE UPPER FEMORAL AND ILIAC VEINS

Outspoken phlegmasia alba dolens, that is, the common milk-leg type of thrombophlebitis, is not the subject of these remarks. This disease fully occludes the great veins draining the leg, causes a considerable degree of edema, and if it were not a rather common cause of arterial or peripheral vasospasm and of disabling postphlebitic disorders, would be of little surgical interest. It is rather the nonobstructing thrombosis, forming the soft thrombus which sometimes fills the femoral and iliac veins, even floating up into the vena cava, that is in question here. In recent years, several German and French surgeons (Kulenkampff,[4] Fründ,[5] Läwen,[6] Leriche[7]) have attacked such disorders without exactly defining them. But Läwen,[8, 9] in particular, distinguishes between bland thrombosis and an outspoken thrombophlebitis, the same distinction that I am making here. I think it probable that most of these processes originate in the lower leg—recent observations of Frykholm[10] and others strongly support this contention—and that bland, nonobstructing femoral thrombosis has usually ascended from that region,* adhering to the vein here and there, and filling it loosely, without actually blocking it.

*In one case I actually watched a typical lower-leg deep thrombus, causing no swelling but a positive dorsiflexion sign, jump, as it were, and fully obstruct the upper femoral vein, producing swelling of the entire leg.

Such a thrombosis often, though not always, calls attention to the limb, even during life in bed, by some swelling and cyanosis below the knee. It is a source of repeated embolism, which ends, as a rule, in death. Pieces break off in the external or common iliac vein, until a considerable mass accumulates in the pulmonary vessels or until the detachment of an especially large mass ends the patient's life. Sometimes the process is bilateral, moderate swelling and blueness appearing only at one ankle, although quite as much thrombosis is present in the deep veins of the opposite limb.

Although both French and German surgeons have purposefully removed detachable thrombi from the common femoral and external iliac veins, — usually through an opening in the superficial femoral at the groin, — my own early experience followed the direction of an attempt to shut off the current and cause the process to become organized, until Dr. Arthur W. Allen demonstrated that through an opening in the common femoral vein, a huge mass of clot could be sucked out and the great veins safely cleared of thrombosed and clotted blood. I believe that in the future, instead of at once dividing the various femoral veins as he did, it might be permissible to repair the vein and institute for the next few days a vigorous heparinization. This step should safely restore, at least for the time being, the venous pathways, but whether it might not lead to a recurrence in the distant future is uncertain. At least, repair without division has safely been used* even before heparin was available.

The femoral vein at the groin should, then, be explored when, following a nonfatal embolism, evidence is secured that a nonobstructing or only partially obstructing thrombosis is present in the femoral and iliac veins. Through an opening in the superficial or perhaps the common femoral vein, the proximal and some of the distal part of the thrombus can be sucked out, and the accessible veins repaired or divided. Such a procedure is probably, in skilled hands, less hazardous than nonoperative treatment. I hardly dare put the matter more strongly.

Exploration of the Femoral Vein

The vessel may be approached by way of a long, oblique incision, parallel to the inguinal ligament (my own preference) or by a longitudinal incision, which must cross the ligament and be carried up on the abdominal wall.

The pulsation in the femoral artery is the guide to the situation of the vein, which lies medial to it; and the saphenous vein, which should at first be preserved, leads the operator to the femoral vein itself. The soft tissues just lateral to the saphenous opening should be treated with respect, since they contain the lymph nodes so often inflamed in association with thrombosing processes in the leg.

Having demonstrated the saphenous opening and cleared the fascia lata below it, downward for 6 or 7 cm. and for perhaps 2 or 3 cm. above, one can easily expose a considerable stretch of the femoral vein. The vein and its branches must now be freed, so that short lengths of small, soft rubber tubing can be passed, respectively, about the common femoral vein above, the superficial femoral vein below, the profunda vein behind and the great saphenous vein in front. Since it is impossible to identify any but the most solid thrombus within the vein, the superficial femoral vein should now be incised longitudinally. The tubes control the bleeding.

Should an altogether loose clot be found, it is best sucked out. Good-sized glass tubing, having a smooth end, will do, but Dr. Allen demonstrated to me a good use for the Trendelenburg suction tube and reservoir, although it may be too large for the superficial femoral vein. What should one do if the thrombus seems rather adherent? The conservative surgeon will merely divide every vein and withdraw, as I have done.† The more radical surgeon will vigorously suck out the adherent thrombus, as I should feel justified in doing. He may then ligate and divide all veins or repair the opening in the femoral vein and heparinize the patient. During the convalescence, which, in case of division, may be attended by considerable edema and cyanosis of the leg, the foot of the bed should be raised 10 to 15 cm. above the head, and the leg left free for exercise. It should be recognized that whereas division of the superficial femoral vein for thrombosis confined to some group of deep veins below the knee is attended by little or no edema and cyanosis, the situation when the whole femoral system is occupied is very different; collateral pathways are perhaps involved, and division may cause serious edema.

Exploration and Division of the Femoral and Iliac Veins

For Recurrent Embolism

Recurrent embolisms are commoner than one would suppose. I have recently encountered four such cases. They are likely to be picked up by the cardiologist, since they are readily mistaken

*In 1926, Bazy[11] removed a soft thrombus from the axillary vein, which he repaired, in a case of *thrombose par effort*. Edema soon receded, and the patient recovered. Other similar experiences have been recorded, and many, perhaps, have never been published. But fatalities as well have occurred (see discussion of Kulenkampff's[4] communication).

†In one such case, embolism recurred, and I was finally obliged to divide the common iliac vein; embolism ceased, and the leg has become functionally useful.

for cases of myocardial infarction due to coronary disease. A study of the problem of repeated embolism is a fascinating one, and I[2] have already published the details of a number of these cases.

The history is most important. Is there a story consistent with an earlier thrombophlebitis? This may take the form of a typical phlegmasia alba dolens, which, though of itself an uncommon source of embolism, may lead to a local recurrent thrombosis and subsequent embolism; a previous nonobstructing thrombosis in the lower leg or higher, associated with embolism; or a superficial thrombophlebitis, in the saphenous system, for instance, perhaps in a varicose vein, from which

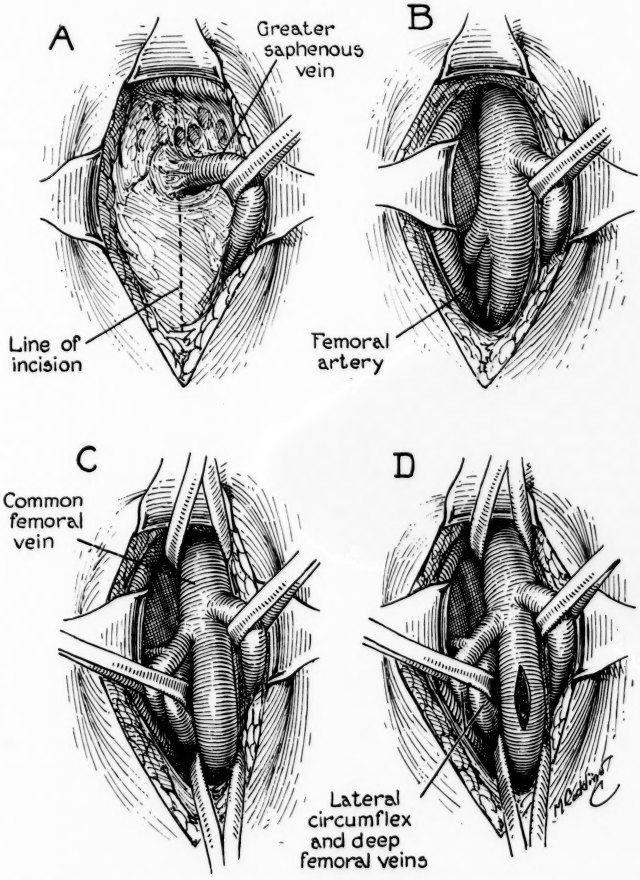

FIGURE 1. *Semidiagrammatic Sketch Demonstrating Exploration of the Right Femoral Vein.*

A. *Incision at the groin exposing the saphenous opening; site of incision of deep fascia.* B. *The common femoral vein and its branches; the femoral artery is retracted laterally.* C. *Soft tubing is placed around the various veins.* D. *As the tightened tubes control bleeding, the superficial vein is opened, revealing a thrombus.*

small emboli may have been detached, or which may have extruded a propagating thrombus into the femoral.

It is in running down an earlier thrombophlebitis that a venogram may be remarkably useful (Dougherty and Homans[12]). It may be possible to show that the femoral vein is of irregular caliber and without valves, owing to previous disease. In a case of this sort — that of a man condemned to invalidism because of supposed coronary disease — I found, on transperitoneal exploration, the left external iliac vein adherent to the artery and partly filled with fibrous ribbons left by canalization of the old process. Division of the vein has for over two years prevented recurrence of the former minor embolisms.

In other cases, following a story of old thrombosis and embolism, it has seemed best to operate immediately after the most recent episode, provided the same leg as before has clearly been affected, since, at this moment, exploration of the femoral region may demonstrate, more accurately than at any other time, the situation of the process. For example, exploration may reveal that this is and has been altogether below the groin, or perhaps in the great saphenous vein. If sclerosis and adhesion of the common femoral vein behind the inguinal ligament show that the process has extended higher, the choice is given of dividing the superficial femoral vein, on the ground that blocking this now valveless and sclerosed vessel will prevent further recurrence of the thrombosis, or of exploring retroperitoneally or transperitoneally the iliac veins and dividing the external or common iliac vein. I can only hint at some of the possibilities in this fascinating field. The most satisfactory aspect of proximal division to forestall further embolism is that such division appears to have a favorable effect on the peripheral circulation; that is, a collateral circulation having already been established, little cyanosis or additional swelling follows. The foot is apt to feel warmer, and the leg is afterward the source of fewer discomforts. This favorable effect may be due to the prevention of reflexly excited vasospasm and to the relief of back pressure in a valveless vein. To say that in any one case the operation has guaranteed the patient against embolism is, of course, unjustified, even after the flight of considerable time.

To Relieve Local Arterial Or Peripheral Vasospasm

Exploration to relieve vasospasm is, of course, a field as to which little is known. Actually, any one of three types of vasospasm may be associated with a femoroiliac thrombophlebitis. The first is the diffuse peripheral type, thought to occur principally in the venules just beyond the capillary bed; this is believed to be an important cause of the edema of phlegmasia alba dolens, and according to Leriche and Geisendorf,[13] Ochsner and DeBakey[14, 15] and others, is relieved by sympathetic lumbar procaine block. I am inclined to agree that lumbar block does in some degree release such vasospasm. In any case, exploration is not demanded.

The second variety of vasospasm is represented by a sudden constriction of the great artery accompanying the thrombosed vein. This is a rare event, but serious. It shuts off, or nearly shuts off, the arterial supply to the limb, and may actually lead to gangrene. Explorations have disclosed the contracted, threadlike artery but have accomplished little. I myself have seen such spasm disappear after an effective lumbar sympathetic block. It is quite capable of relaxing spontaneously — and unpredictably.

The third variety is the late, diffuse peripheral spasm, related to the early acute type, which may remain for years after an initial femoroiliac thrombophlebitis has subsided. This is probably due to fibrosis of the wall of the great vein and to an irritation of perivascular nerves, sensory or vasomotor or both. Its effect is causalgia-like; that is, the limb is slightly cyanotic, edematous and oversensitive to pinprick and pressure. Confirmation of a tentative diagnosis is secured by noting the immediate temporary relief obtained by a lumbar sympathetic procaine block. Such an effect may even, in mild cases, be prolonged by repeated lumbar injections until it has become a cure. Sympathectomy relieves with even more certainty, but there may also be an advantage in dissecting apart the great iliac and femoral vessels and even in dividing the great vein. This is Leriche's particular contribution. Naturally, the operation requires considerable skill and familiarity with the handling of large blood vessels. I believe that the right iliac vessels should be approached extraperitoneally; the left, transperitoneally.

Division of the Femoral or Iliac Veins Following an Old Thrombophlebitis to Prevent Backflow

I have several times remarked on the apparent harmlessness and even benefit to the circulation of high division of such femoral or iliac veins as have previously been the seat of thrombophlebitis. I hardly care to go farther into this subject here. Obviously, the femoral system, once thrombosed, must suffer the loss of all its valves (there is rarely one in the external iliac vein and none above), so that when the body is erect, the venous return must take collateral, valved pathways. Blood must pour down a valveless vein, and it is

therefore reasonable to assume that an old, sclerosed, canalized femoral or external iliac vein is better divided. I have never performed division of such a vein for back pressure alone, not fully understanding the indications, but I am sure that the procedure—barring the risk of any such operation in patients of middle age or beyond—will always do good, and never harm.

Summary and Conclusions

Evidence has been produced to show that bland, nonobstructing thrombosis of the leg, whether occurring in active life or life in bed, and whether confined to the venous plexuses among the muscles below the knee or occupying as well the femoral and even iliac veins, is a frequent source of pulmonary embolism. This type of thrombosis, though difficult of identification, can often be diagnosed, whether or not embolism has occurred, by a combination of clinical symptoms with discomfort behind the knee on forced dorsiflexion of the foot. Conservative treatment of this disorder is usually justified, but when embolism has occurred or when symptoms and signs have recurred at least once, exploration and division of the femoral vein are advisable.

Exploration and division of the femoral and iliac veins may also be indicated to cure peripheral vasospasm, especially when the vein has been the seat of previous thrombophlebitis, and to guard against the further recurrence of pulmonary embolism repeated once or more.

Division of the superficial femoral vein, in the presence of a bland, nonobstructing thrombosis below the knee, is rapidly curative and leads to no swelling and cyanosis of the leg. Division of the common femoral and profunda veins for a bland, nonobstructive thrombosis that occupies the femoral vein itself causes considerable edema and cyanosis.

Division of the superficial femoral, common femoral or even common iliac vein, following an old, canalized thrombophlebitis, causes little disturbance and may, by relief of reflex vasospasm and by the prevention of backflow in the vessel, be of benefit to the venous circulation.

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Discussion

Dr. Henry H. Faxon, Boston: Our active interest in this type of operation at the Massachusetts General Hospital goes back only a few years, and it is characteristic of Dr. Homans's enthusiasm in this field that he was doing some such operation many years ago.

In my discussion of his paper I shall confine myself to the operation as it relates to the prevention of emboli. I should like to make three points and possibly ask one question.

The first point, it seems to me, is of fundamental importance in a consideration of this whole problem, and Dr. Homans has not been perhaps too explicit concerning it. Specifically we should like to know, in a patient with a deep phlebitis, what are the chances of his getting an infarct, and what are the chances of his getting a fatal pulmonary embolus. The operation mentioned by Dr. Homans is not without a certain amount of risk, and to evaluate the urgency for doing it, one should know what chance the patient runs of having a serious catastrophe if the operation is not performed.

Dr. Welch and I, at the Massachusetts General Hospital, have reviewed the cases of clinical phlebitis and pulmonary embolus in the last few years. From this study we have come to believe that if a patient has a deep phlebitis in an extremity, he stands one chance out of three of having a pulmonary infarct, and one out of twenty-five of having a fatal massive embolus.

We do not know yet, because we have not done enough operations, how great is the risk of the procedure suggested by Dr. Homans. The risk is small, I am ready to admit. We have done about twelve of these operations with certain modifications of the technic outlined by Dr. Homans. We have had no fatality at the hospital. I have had one fatality in a patient at an outside hospital, who was operated on when she was in extremis. She had a high temperature, had had multiple infarcts and was obviously going to die if nothing was attempted, and she did die following exploration of the femoral vein.

My second point, one on which he laid very little stress, and one that I consider very important, is that the age of the patient makes a great deal of difference as to whether or not this operation should be carried out.

In looking over the cases of deep phlebitis at the hospital, it was interesting to note that if the patient was under fifty years of age, the chance of his having a fatal massive pulmonary embolus was very small. Less than 2 per cent of the cases under the age of fifty had a massive pulmonary embolus from a demonstrable, clinical phlebitis. On the other hand, when the people with deep

phlebitis were between the ages of fifty and sixty, about 7 per cent suffered a massive embolus, and in the small group of patients over sixty who had deep phlebitis, nearly 20 per cent had a massive fatal embolus.

It is our belief at the present time, and it is subject to revision, that we should be strongly tempted, in a case of deep phlebitis under the age of fifty, to treat the patient conservatively with the measures we already know, including the use of heparin. When we consider patients who are older, the urge to do this operation, in our minds, becomes progressively greater.

The third point I should like to make is to stress again what Dr. Homans has suggested: namely, that the problem of massive pulmonary embolus is by no means synonymous with that of demonstrable clinical phlebitis. In the last few years we have had 128 cases of massive pulmonary embolus, and in less than 6 per cent was there in the record any suggestion of a deep phlebitis. It is true, probably, that if the examination of those patients had been carried out more carefully many of them would have been found to have had definite or suggestive signs of deep phlebitis.

The question I should like to ask Dr. Homans is, Why, when he believes that most of these emboli come from the popliteal space or the venous plexus in the calf of the leg and that the valves of the deep system are extensively damaged following a deep phlebitic process, — an assumption that I question, — should he ever suggest opening the vein, aspirating the clot, and then suturing that opening in the vein and heparinizing the patient? I think that if an operative procedure is indicated, one should certainly put a dam across that femoral vein so that an embolus from the lower portion of the extremity could not possibly become dislodged and give the case a fatal outcome. In other words, one may open a certain number of femoral veins and find no clot, or one may open a certain number and aspirate a clot, but in either event there is no definite assurance that there is no additional clot in the region of the popliteal space or calf muscles that may still be a menace to the patient if the continuity of the vein is not interrupted in some way.

Dr. Eugene E. O'Neil, Boston: Anyone who has seen a patient die of pulmonary embolism due to a known lower-leg thrombosis must be impressed by the necessity of doing a femoroiliac-vein ligation.

My attention was called to the urgency of this procedure some years ago in a woman whom I had discharged three months after an original trauma to the lower leg, and in whom I had made a diagnosis of thrombosis of the posterior tibial veins. I mention this because it brought home to me with a shock something that I had not appreciated before; namely, that people can have propagating clots in their venous systems for a very long time, and that these clots can become detached and cause sudden death. This particular case was proved at autopsy. Since that time I have explored and ligated 20 cases.

I concur in what Dr. Faxon has said about the age limits for this group. Eighteen of my patients were over the age of fifty-five. I had an impression in reading the original paper that Dr. Homans sent to me that he was somewhat emphatic in stating that this operation should be used only in the young and middle-aged groups. Perhaps my conception of middle age will change as I grow a little older.

I might add that all these cases have been operated on in accordance with the indications that Dr. Homans has laid down, and that I am quite in agreement with them. The technic does not differ materially from his, except that I believe that the majority of these cases can be approached below the inguinal ligament through the superficial femoral vein. Although I have tied off four external iliac veins and two common iliac veins, at the present time I think that most of these thrombi can be approached through the superficial femoral vein, and the clot removed, with little likelihood of a fatality.

Concerning the tying off of the femoral vein for recurrent emboli and recurrent phlebitis, my experience is confined to a single case. In cases of acute phlebitis in varicose veins, as well as recurrent phlebitis, the quickest way to stop the phlebitis is to do an immediate ligation. I should like to make a plea here that in all these cases of acute phlebitis in superficial veins, an immediate ligation be done. I am sure that that will get the patient back to normal much more quickly than any other method. If this is so, it seems to me that the application of that principle to the deep vein is sound.

One more thought concerning these cases of chronic vasospasm, which manifest these causalgia-like signs and symptoms. Since I have had no experience with exploring these veins for that condition, I should consider a lumbar sympathectomy not only to be technically easier but also, perhaps, to result in more permanent effects. Certainly in my hands the operation for lumbar sympathectomy in these cases has given extremely satisfactory results, more so, probably, than any other condition for which I have done sympathectomies.

The problem that Dr. Homans has presented is a very important and fascinating one. If we remember to look at our patients' legs occasionally, post partum or postoperatively, or following trauma, I think that we shall be exploring these veins oftener, and occasionally saving a life.

Dr. Frank R. Ober, Boston: In some prolonged cases of synovitis of the knee, so-called "water on the knee," in which an associated swelling of the calf has not responded to treatment, the diagnosis of phlebitis must be considered.

A few years ago a colleague of Dr. Homans and mine had an attack of synovitis of the knee that did not respond to treatment. This man died very suddenly from pulmonary embolus, as the autopsy revealed. It is such cases that usually come to the orthopedic surgeon, who is apt to think in terms of joints. I think it behooves us to think also of the joint in terms of circulation. Treatment of synovitis of the knee is a relatively simple problem, but all of us should be on the alert in making the diagnosis to inspect the circulatory system as well as the knee, because we may thus obtain additional information that has a direct bearing on the joint affection.

Dr. Homans (closing): I have been very much enlightened by this discussion.

Dr. Faxon asks why, having opened a vein, one should ever close the opening and heparinize. I was thinking of the cases in which the thrombosis has occurred above the point where the vein is conveniently opened. All explorations must be made, practically, through the groin; there may be thrombosis above that point, and it does little good to divide the superficial femoral vein alone, since plenty of current comes from the various branches that enter the common femoral and external iliac veins. It was in relation to that that I considered the possibility of heparinization and closure of the opening.

Of course, for all thromboses below the groin I think the vein ought to be divided. I am sure that the vein ought never to be closed and heparinized in such cases.

When I heard Dr. O'Neil use the word "ligate," it excited me, as it always does, because I think one should not speak of ligating a vessel. You cannot divide a vessel without ligating, but if you ligate it alone, you do not

do the same thing as if you divide it. I think we have used the word loosely. Dr. O'Neil really means "divide," or even "resect."

In respect to Dr. O'Neil's remarks about the relief of peripheral vasospasm by sympathectomy rather than by exploring the vein itself, I am inclined to agree with him, but I have been trying to learn something about the subject by exploring the vessels themselves, and in one or two cases I have relieved peripheral spasm by dividing the vein where there was an obvious thickening of its wall, so that sympathectomy has not been required.

I was interested in what Dr. Faxon had to say about percentages of infarction and embolism, which is very much worth considering. All that I have said on the subject really has back of it the idea that one should have no accidents following the operations I have recommended and that one should therefore do better than Nature will alone. That one can perform these operations without any accidents or with fewer accidents in the way of embolism than when no operation is used, is not yet clearly proved, but I think that the procedures are safe.

As to the age of the patient, I believe I agree entirely. I have been using division of the vein for two purposes. One was to cure the disease, and the other was to prevent embolism. Division of the vein in thrombosis below the knee cures the disease very rapidly, and although I am sure that these young people may suffer embolism, they seldom actually do so. On the other hand, the disease is very rapidly cured.

In respect to the disease that begins below the knee, — the quiet disease, the source of the fatal embolism, — I have learned from Dr. John Sears that he sees more cases with outspoken symptoms than I do. He showed me a case this summer of a patient with a tender calf, slight swelling and real pain. I have been assuming always that patients whose thrombosis takes place among the muscles of the calf show almost no symptoms, and I have taken it for granted that the more symptoms the patient exhibits, the more inflammatory is the disease, and the less the chance of embolism. Whether that is a proper point of view, I do not know. On the whole I think it is, but I know that Dr. Sears has been dividing these femoral veins in cases in which the patient's symptoms have been outspoken, and yet the thrombosis has been proved, on the operating table, to be of the lower-leg rather than the femoroiliac type.

I am very much obliged for the discussion, but I should have been more obliged to the discussers if they had not taught me quite so much.

SARCOIDOSIS WITH BRONCHIAL INVOLVEMENT*

Report of a Case with Bronchoscopic and Pathological Observations

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BOSTON

SARCOIDOSIS, or Hutchinson–Boeck's disease, is a generalized systemic disease that, according to Hunter,[1] may involve, in addition to the skin, the lymph nodes, spleen, lungs, bones, mucous membranes, conjunctivas and parotid glands. The histology of the lesions resembles that of tuberculosis except that no caseation is observed and no tubercle bacilli are found, even by guinea-pig inoculation. The disease has been frequently reported involving the lungs and tracheobronchial lymph nodes, but so far as we have observed it has not been reported clinically in the tracheobronchial tree. Snapper,[2] however, states that Boeck reported sarcoid occurring in the bronchus. After looking through the original articles of Boeck to which Snapper refers, we have been unable to confirm this. In 1929 Bernstein, Konzlemann and Sidlick[3] reported a case of Boeck's sarcoid with involvement of the bronchial mucosa. Clinically their patient showed a bilateral hydrothorax, with severe dyspnea. There was no wheeze, no bronchoscopy was performed, and no clinical diagnosis of bronchial sarcoid was made. At autopsy the bronchial lesion was represented by small hemorrhagic patches. From microscopic examination these authors concluded that the lesion in the bronchiole was an extension from the adventitia of an associated arteriole. Opsahl[4] recently reported a case of bronchial obstruction caused by a mass that, when removed bronchoscopically, had the characteristic histology of sarcoid. In that case, however, tubercle bacilli were found histologically and by guinea-pig inoculation. It therefore appears that he was dealing with tuberculous tracheobronchitis and not with sarcoid. Spencer and Warren[5] reported autopsy findings in a case of sarcoid in which the trachea showed numerous lesions both immediately beneath the mucosa and among the mucous glands, where there was considerable distortion, fibrosis, round-cell infiltration and degeneration. In their case the bronchi were normal, and the tracheal lesions submucosal.

The following case is, we believe, the first to be reported of definitely intrabronchial sarcoid lesions in which the diagnosis was made by bronchoscopy.

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CASE REPORT

R. C. (M. G. H. No. 165665), a 20-year-old Negress, first entered the hospital on December 20, 1938, complaining of

cough. She had been well until 1 year before admission, when she developed a cough not associated with sputum or chest pain. For 6 months she had experienced weekly

FIGURE 1. *Bronchoscopic View at the Carina in Sarcoidosis. Note the widening of the carina and the intrinsic bleb-like lesions on walls of both the main bronchi.*

night sweats, and she had lost some weight. Two months before entry the cough was productive of whitish phlegm, and a mass was noted in the right supraclavicular region. The past and family histories were noncontributory.

Physical examination showed a well-developed and well-nourished colored woman in no pain or discomfort. The only positive findings were palpable, nontender cervical, inguinal and right supraclavicular lymph nodes, measuring 2 or 3 cm. in diameter. The temperature varied from 98 to 102°F., the pulse from 80 to 120, and the respirations from 20 to 30.

The urine showed the slightest possible trace of albumin. The red-cell count was 4,500,000, and the white-cell count 5,150,000, with 56 per cent polymorphonuclears, 29 per cent lymphocytes, 10 per cent monocytes, 3 per cent eosinophils and 2 per cent basophils. The platelets were normal; the red cells showed slight hypochromia. A tuberculin test with a 1:10,000 dilution was negative. A blood Hinton test was negative.

X-ray examination of the chest showed clear lung fields. There was widening of the superior mediastinum anteriorly, more marked on the right, which was interpreted as enlarged lymph nodes consistent with mediastinal lymphoma. There was no evidence of widening of the carina. The trachea and esophagus were not displaced. The hands and feet were normal.

The right supraclavicular lymph node was removed, and when examined microscopically showed complete replacement of the lymphoid tissue by well-circumscribed tubercles composed of epithelioid cells, with an occasional Langerhans giant cell but without any caseation — a picture characteristic of sarcoid. A stain for tubercle bacilli was negative. The patient was discharged on the 11th day to a convalescent home.

The second admission took place 2 months later. At this time the patient complained of continuous sharp pain in the right flank and right shoulder, with pain on coughing or deep breathing. Physical examination showed several pea-sized lumps under the skin in the right chin, right forearm, right 12th rib posteriorly and left 2nd rib anteriorly. Tuberculin tests with 1:5000, 1:1000 and 1:100 dilutions were negative. A biopsy of a subcutaneous nodule in the right flank was reported as consistent with sarcoid.

FIGURE 2. *Photomicrograph of One of the Bronchial Biopsy Specimens. This shows several sarcoid lesions in the region of a group of mucous glands.*

The temperature varied from 98 to 99°F., the pulse from 70 to 90; and the respirations were 20. Examination of the sputum was negative for tubercle bacilli.

After 2 weeks in the hospital the patient was discharged to a convalescent home, where a regimen of rest and high-vitamin diet produced definite improvement. Two months later it was noted that the lymph nodes in the right lower neck seemed a little smaller and softer. Moist sibilant and sonorous rales were heard in the chest on both sides. A skin lesion appeared on the left cheek.

The third admission occurred 8 months later, in January, 1940. During the month before entry, it was noted that the patient was getting worse, had been wheezing and was feeling too sick to work. There was marked generalized lymphadenopathy, especially in the cervical, preauricular and submental regions. Large "furniture-moving" rales were heard throughout the chest. X-ray examination of the chest showed a marked decrease of the mediastinal mass, particularly on the right. The lung fields were clear.

At this time the chief problem was respiratory difficulty suggestive of partial tracheal or bronchial obstruction. The picture clinically was that of asthma, with universal wheezing and rhonchi. In view of these findings and the possibility of tuberculous tracheobronchitis, bronchoscopy was suggested, although the patient seemed rather ill and many of the staff were unenthusiastic.

Bronchoscopy was carried out on February 9. The positive findings were as follows: The mucosa of the trachea was somewhat reddened and edematous. The carina showed definite reddening and thickening, with yellowish bleb-like lesions 2 or 3 mm. in diameter (Fig. 1). The right bronchial tree showed the mucosa to be edematous and reddened throughout, and the lumen markedly narrowed, so much so that the No. 7 bronchoscope would not pass into the right lower lobe. None of the orifices could be seen because of edema of the mucosa. Soft esophageal bougies Nos. 12 to 16 passed satisfactorily into the lower lobe. Because of dyspnea during bronchoscopy, oxygen was administered through the bronchoscope, with marked improvement. The left bronchial tree showed an appearance similar to that at the right, with red edematous mucosa and bleb-like formation. The orifices could not be seen because of edema. A No. 16 bougie was passed into the left lower lobe. The conclusions from bronchoscopy were as follows: definite reddening and edema with bleb-like formations through the entire bronchial tree, and marked narrowing of the main bronchi, accounting for wheeze and dyspnea. Several biopsy specimens were taken from these lesions and showed replacement of the mucosa by an edematous inflammatory reaction composed of lymphocytes and a few polymorphonuclears. Scattered through this tissue were many tubercle-like lesions composed of epithelioid cells with giant cells—an appearance consistent with sarcoid (Fig. 2). Biopsy specimens from another cervical lymph node (Fig. 3) and from a skin lesion in the region of the temple showed a characteristic sarcoid appearance. A smear from material obtained at bronchoscopy showed no tubercle bacilli, and guinea-pig inoculation was negative for tuberculosis. Guinea-pig inoculation of a biopsied lymph node showed no tuberculosis. Repeated examinations of the sputum for tuberculosis were negative. A tuberculin test with a 1:100 dilution was again negative.

On the day after bronchoscopy, the patient was notably better and without wheeze. There was also definitely less cough and dyspnea. Five days following bronchoscopy,

FIGURE 3. *Photomicrograph of a Cervical Lymph Node. This shows complete replacement of the lymphoid tissue by sarcoid, tubercle-like nodules.*

however, there was an increase in wheezing. Ten days later, therefore, bronchoscopy was repeated. At this examination the mucosa showed improvement. There seemed to be fewer lesions, which were pearly gray and almost cystic at the carina. Along the wall of the left main bronchus the appearance was that of whitish, fibrous stenosis with definite narrowing of the lumen. Bougies up to No. 20 were passed into both lower lobe bronchi, and 20 per cent cocaine-adrenalin was applied. A moderate amount of secretion was aspirated. Except for a temperature rise to 104°F. a week after the second bronchoscopy, thought to be due to an attack of grippe, convalescence was uneventful. The patient was discharged improved to a convalescent home on March 25.

She was last seen in the Pulmonary Clinic of the Out Patient Department on October 16, at which time she had no complaints, was feeling very well and was able to do housework. There was less dyspnea, no wheezing and very little cough or sputum. The appetite was very much improved, and the lymph nodes were much smaller.

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Summary

A case of generalized sarcoidosis is reported in which signs and symptoms of bronchial obstruction were the principal features. Bronchoscopy showed extensive intrinsic involvement of the bronchial mucosa, and treatment through the bronchoscope resulted in marked clinical improvement.

So far as we have been able to determine, this is the first reported case of sarcoidosis with intrabronchial lesions in which a positive diagnosis was made by bronchoscopy.

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PERIPHERAL ARTERIAL EMBOLISM*

A Discussion of the Postembolic Vascular Changes and Their Relation to the Restoration of Circulation in Peripheral Embolism

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THE successful restoration of the circulation in a limb following peripheral embolism depends chiefly on early and adequate treatment. All writers on the subject stress the importance of this fact. Thus, in a series of 282 cases collected from the literature, Pearse[1] found that when embolectomy was performed within ten hours of lodgment of the embolus, the extremities were saved in 40 per cent of the cases; after ten to fifteen hours, in only 16 per cent; and after thirty hours, in none. In a series of 129 cases reported by Danzis,[2] 47 patients were operated on within eight hours, and in 27 cases (57 per cent) the circulation was restored; in 24 cases operated on between eight and twelve hours after lodgment, it was restored in only 6 (25 per cent). Similar statistics are given by Key,[3] Petitpierre[4] and Dschanelidze and Ogloblina.[5] Early treatment is of equal importance when cases are treated with the negative-positive-pressure (pavex) apparatus, as was shown by me[6] in a series of 13 cases. In this group, 9 (60 per cent) of 15 extremities were saved; the treatment was instituted within ten hours in 8 (90 per cent) of these.

The commonest cause of gangrene following peripheral embolism is the failure to institute adequate treatment before the arteries distal to the embolus have been irreparably damaged. It is rarely the result of poor surgery or inadequate treatment. Thus the loss of a limb is directly attributable to the failure of the physician who first sees the patient either to make a correct diagnosis or to realize the imperativeness of early treatment. Since the diagnosis of arterial embolism has been discussed adequately by Pearse,[1] Danzis,[2] Key,[3] McKechnie and Allen,[7] Allen[8] and others, it is not necessary to consider this phase of the subject. On the other hand, very little has been written concerning the pathologic changes that take place in the arteries of an extremity following the lodgment of an embolus, and the significance of these changes in reference to restoration of the circulation.

The purpose of this paper is to emphasize the importance of early adequate treatment in arterial embolism by discussing the postembolic arterial

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changes in a group of selected cases of peripheral embolism treated in the Peripheral Vascular Clinic of the Massachusetts General Hospital. In some of these cases there was a successful restoration of circulation, whereas in others gangrene developed.

Failure to restore the circulation in an extremity following embolism is due primarily to the marked vasoconstriction distal to the embolus, and the formation of a secondary thrombus in the arterial tree that extends distally from the site of embolism into all the tributaries and finer ramifications. The marked spasm of the arteries has been recognized for many years. It has been described by Seifert[9] and observed by many surgeons who have performed embolectomies. The secondary thrombosis has also been described by Nyström,[10] Zierold[11] and other authorities, but its role in the results obtained has not been sufficiently stressed in the literature. This secondary thrombus, if it forms, makes the difference between success or failure in the restoration of the circulation. It undoubtedly develops as a result of the extreme degree of vasoconstriction and slowing of the blood stream, which occurs distal to the site of embolism, since the marked narrowing of the main and the collateral arteries, in addition to the obstruction by the embolus, causes practically a cessation of the arterial inflow to the extremity. This leads to stagnation of the blood in the involved arteries, which later clots to form the thrombus. Whether thrombosis begins at the most distal portion of the extremity and extends upward, or just distal to the embolus, as a result of the irritation to the intima, has not been established.

The constriction of the artery distal to the embolus, which probably occurs almost instantaneously after the lodgment of the embolus, is followed in a few hours by the development of complete thrombosis of the artery. In one of the cases reported in this article, an extreme degree of arterial spasm was noted one and a half hours after the time of embolism, and in another case, a very extensive thrombosis had formed nine hours after the time of embolism. The ideal treatment to restore the circulation of an extremity, following the lodgment of an embolus, is to remove it as soon as possible. In addition, treatment should be instituted to prevent the formation of a secondary thrombus, since this may occur even after embolectomy, owing to damage of the intima, from both the operation and the impaction of the embolus. This treatment should be directed toward the production of peripheral vasodilatation to increase the arterial inflow to the extremity. One method of doing this is to interrupt the sympathetic vasoconstrictor impulses by a novocain or alcohol injection of the lumbar ganglia. Another is by mechanical dilatation, using intermittent suction and pressure (pavex) or intermittent venous occlusion. The intravenous injection of heparin may also be used to prevent the formation of the secondary thrombus. To emphasize the role of vasoconstriction and secondary thrombus formation, the following cases are presented.

Case Reports

Case 1. A 54-year-old man with rheumatic heart disease and auricular fibrillation suddenly developed pain and numbness of the left arm. Examination revealed that there were no pulsations below the axillary artery. An operation was performed 1½ hours after the occurrence of the embolism, and an embolus was removed from the left axillary artery. At operation, marked constriction of the artery to about one third its normal caliber was noted distal to the embolus. There was practically no vasoconstriction above the site of embolism. After removal of the embolus, with the artery occluded proximal to the opening, there was an excellent flow of blood from it, indicating that the collateral arterial blood channels were patent and that there was no secondary thrombus in the arterial tree distal to the site of embolism. As further evidence of this, there was an immediate restoration of the circulation following suture of the arteriotomy wound, and in addition, examination of the specimen revealed it to be a single homogeneous blood clot (Fig. 1).

Figure 1.

This photograph shows the embolus removed from the left axillary artery in Case 1, one and a half hours from the time of embolism. It should be noted that this specimen consists only of the embolus, without any evidence of a secondary thrombus.

Case 2. A 45-year-old man with rheumatic heart disease and auricular fibrillation suddenly developed pain and numbness of the left leg. Examination showed no pulsations in any of the arteries of this extremity. They were normal in the right leg. A diagnosis was made of an embolus lodged at the bifurcation of the left common iliac artery. Two and a half hours after the time of

embolism, an embolus was removed from this artery. The operative findings are shown in Figure 2. The extreme narrowing of both the external and internal iliac arteries distal to the embolus should be noted. At operation this constriction extended as far as the vessels could be traced distally, that is, down to the inguinal ligament and into

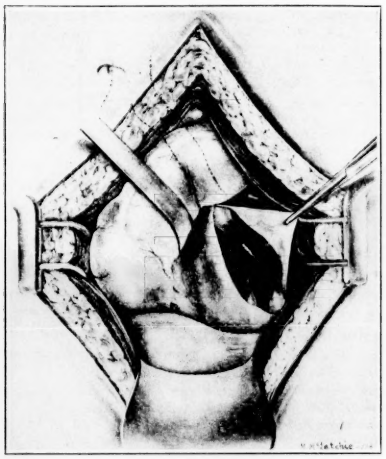

FIGURE 2.

This drawing shows the transabdominal operative exposure for embolism of the left common iliac artery used in Case 2. This exposure was made within two and a half hours after the lodgment of the embolus. The marked narrowing of the external and the internal iliac arteries should be noted. This extended distally as far as the arteries could be traced. The constriction of the common iliac artery proximal to the embolus, on the other hand, is seen to be present over a very short distance. The incision made in the artery to remove the embolus is shown.

the pelvis, a distance of several centimeters. The common iliac artery above the embolus was also narrowed, but of utmost importance was the fact that contrary to the constriction distalward, it was very sharply localized, so as to involve less than a centimeter of the artery. Above this point the artery was of normal caliber. The embolus removed is shown in Figure 3. At operation there was no evidence of a secondary thrombus distal to the embolus, in either the internal or the external iliac arteries. There was profuse back bleeding when the tourniquets on these vessels were released. In addition, after the operation was concluded, it was possible to palpate the pulsations in the popliteal artery, the dorsalis pedis and the posterior tibial arteries. This was positive evidence that there had been a complete re-establishment of the arterial circulation, and that a secondary thrombus had not formed within 2½ hours of the time of embolism.

In the two following cases the arterial circulation was not restored following embolectomy; the result in both was gangrene, necessitating amputation.

CASE 3. A 55-year-old woman with rheumatic heart disease and auricular fibrillation had been in the hospital for 10 days, when she was suddenly seized with severe pain and numbness in the right leg. A diagnosis of peripheral embolism of the right common femoral artery was not made until 8 hours later. The embolus (Fig. 4) was removed approximately 9 hours after the onset of symptoms.

With these facts in mind, a careful examination of the specimen yielded some highly valuable information. The embolus consisted of two parts, a short, thick one, and a long, narrow one. The former was grayish pink and quite firm in consistence, whereas the latter was dark reddish brown and very friable. The thicker portion represents the embolus, the narrow portion a secondary thrombus, which had formed after lodgment of the embolus. The embolus was lodged at the bifurcation of the common femoral artery and the thrombus was found to be

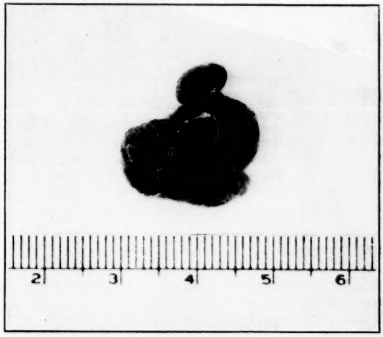

FIGURE 3.

This is a photograph of the embolus removed from the left common iliac artery at its bifurcation into the external and internal iliac arteries in Case 2. The operation was done two and a half hours after the lodgment of the embolus. The main part of the embolus lay in the common iliac artery. The two projections on the specimen represent the portions of the embolus that were in the external and internal iliac arteries. The diameter of these indicates the marked constriction of the arteries. The absence of any secondary thrombus should be noted.

lying distal to it. The difference in the diameter of the two should be noted. The embolus was several times greater in caliber than the secondary thrombus. Despite this fact, each completely filled the artery in which it was lodged. Thus examination of this specimen showed clearly the marked degree of arterial constriction that takes place distal to the site of embolism.

The removal of the embolus was a relatively simple matter, but the secondary thrombus was removed with great difficulty. The only satisfactory method of extracting it was by milking the vessel upward, and even then it was impossible to ascertain if all of it had been obtained. Of great significance was the fact that there was very little bleeding from the distal part of the femoral artery after the removal of this specimen, which indicated that it

had not been completely removed. This was further substantiated immediately after the operation by the lack of pulsation in the popliteal, dorsalis pedis and posterior tibial arteries. Gangrene developed in the foot and lower leg within 24 hours, necessitating a mid-thigh amputation.

CASE 4. A 61-year-old man who had coronary heart disease developed an embolism of the left popliteal artery, and operation was performed 72 hours after its occurrence. The embolus and a portion of a secondary thrombus were removed, but gangrene of the foot developed, necessitating amputation of the leg.

Examination of the specimen (Fig. 5) showed it to consist of an embolus with a distal and proximal secondary thrombus attached to it. The central, light-colored portion represented the embolus, whereas the narrow, dark-colored part was a small piece of the distal thrombus. The dark, thick portion, which was of the same caliber as the embolus, was the proximal secondary thrombus. The two thrombi were about the same length. It is to be noted, however, that the proximal one is shown in its entirety, whereas only a small portion of the distal one can be seen in the photograph. There can be little doubt of these facts, because on removal of the embolus and the proximal thrombus there was a tremendous spurt of arterial blood from the upper end of the incision in the popliteal artery, yet there was no bleeding from the lower end. In addition, the posterior tibial artery was exposed behind the medial malleolus, and when opened was found to be completely occluded by the distal thrombus. The artery was irrigated with a 2 per cent solution of sodium citrate from below upward, a modification of the method described by Lerman, Miller and Lund.[12] Many pieces of the distal thrombus were washed out through the opening in the popliteal artery. Even after a clear flow of the irrigating fluid had been obtained above, there was no evidence of

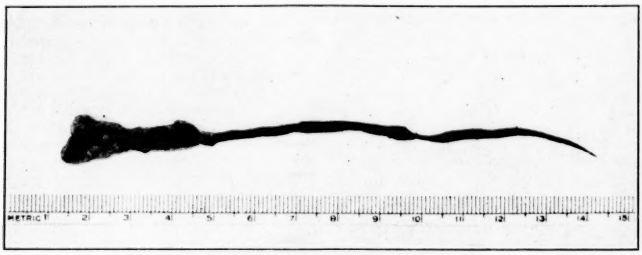

FIGURE 4.

This photograph shows the embolus and a portion of the secondary thrombus that had formed distal to the embolus from the femoral artery in Case 3. The specimen was removed from the common femoral and the superficial femoral arteries nine hours after the time of embolism. The portion with greatest diameter represents the embolus and the long narrow portion, the secondary thrombus. The small caliber of the latter indicates the marked constriction that was present in the arteries distal to the embolus.

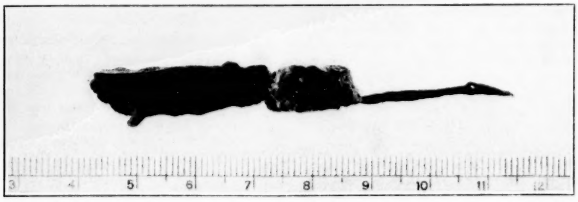

FIGURE 5.

This is a photograph of the embolus and a small portion of the distal and proximal secondary thrombi attached to it removed from the popliteal artery of Case 4 seventy-two hours after the time of embolism. The central gray portion represents the embolus. The narrow part of the specimen is a portion of the distal thrombus, and its caliber indicates the extreme narrowing of the arterial tree distal to the embolus. The dark portion at the larger end of the specimen is the proximal thrombus. In contradistinction to the portion of the distal thrombus shown, it represents the entire proximal clot. Its large caliber shows how little constriction of the artery had occurred proximal to the embolus.

bleeding from the distal part of the popliteal artery, or from the posterior tibial artery. This showed that the distal secondary thrombus had extended into the branches of the popliteal artery and their tributaries to such an extent as to block all blood flow through them.

Further study of the specimen revealed the state of the arteries proximal and distal to the site of embolism. The fact that the large proximal thrombus was practically the same in diameter as the embolus itself indicates that there was little if any vasoconstriction of this portion of the popliteal artery. In addition, it is to be emphasized that this thrombus was relatively short, so that it interfered very little with collateral circulation, by occluding the openings of arterial branches arising from the popliteal artery above the embolus. In contradistinction, the secondary thrombus distal to the embolus was extremely small in diameter. This indicated the extreme degree of vasoconstriction present in the arteries distal to the site of embolism. Exploration of the posterior tibial artery at the ankle showed that this vasoconstriction and thrombosis extended distally into the foot.

An analysis of the following case, which was treated by the intermittent negative-positive-pressure (pavex) method, gives further evidence of the importance of early treatment in preventing secondary thrombus formation.

Case 5. A 36-year-old woman was admitted to the hospital because of rheumatic heart disease with mitral stenosis. Five days after admission she first noted numbness of the left foot. An hour and a half later, the left leg was cold and cyanotic up to the knee. There was complete loss of sensation over the entire foot, and the patient could not move the foot or toes. No pulsations were palpable in any of the vessels of both legs, including the femoral arteries. The blood pressure and pulsations were normal in the arm vessels. A diagnosis of a so-called "rider" embolus at the bifurcation of the aorta was made. The left leg remained cadaveric in appearance, but the right maintained a normal appearance, with complete muscular control. The left leg was placed in the negative-positive-pressure apparatus 3½ hours after the initial symptoms were noted by the patient. Ten cubic centimeters of 1 per cent novocain was injected in the neighborhood of the 2nd, 3rd and 4th lumbar vertebrae on the left side. This was done to produce temporary peripheral vasodilatation by interrupting the sympathetic vasoconstrictor pathways, so that an active collateral circulation might be developed. The negative-positive-pressure treatments were continued on the left leg for about 48 hours and then for decreasing intervals, until they were stopped on the 8th day. The right leg was also given some treatments because its circulation began to fail. It responded more rapidly than the left, indicating a better collateral blood supply. The treatments to the right leg were continuous for the first 24 hours, after which they were given at intervals and gradually diminished until they were also stopped on the 8th day after the embolism occurred. At that time, both legs had normal color and warmth, and there was complete control of all the muscles. There was no evidence of gangrene. Yet examination revealed no pulsations in any of the arteries of either leg. Three days later, the patient suddenly lost consciousness and developed a hemiplegia. Death followed in 12 hours. At the postmortem examination the cause of death was found to be an embolism of the basilar artery and the right posteromedial ganglionic artery.

It is true that this patient survived the primary embolism for only eleven days, which according to some writers is too short a time to allow restoration of circulation in an affected limb. However, it is to be noted that the return of the circulation in the legs was so complete that treatments in the pavex apparatus were discontinued 3 days before death. It seems unquestionable that if this patient had not developed embolism of the cerebral arteries, the circulation of the legs would have been restored for an indefinite period. An analysis of the post-mortem findings substantiated this view.

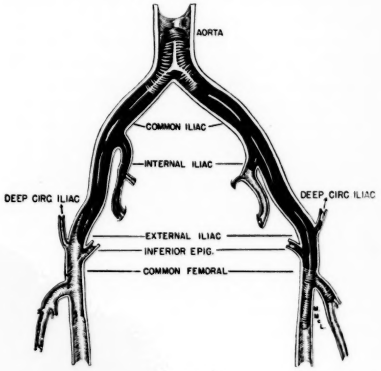

Figure 6.

This is a diagrammatic sketch to show the location of the emboli and thrombi in the aorta and its main tributaries in Case 5. On the right this clot extended down to the point where the deep epigastric artery arises from the external iliac. On the left the secondary thrombus had occluded the left common femoral artery. It is to be noted that the vessels distal to the emboli and thrombi remained patent and contained no blood clot.

At the autopsy it was found that the aorta was occluded at its bifurcation by an embolus and that there were thrombi extending from this distally into the right and left external and internal iliac arteries. On the right, the thrombus extended 6 cm. down the external iliac artery and about 1 cm. above the profunda femoris. In the right internal iliac artery it extended a distance of 9 cm. On the left, the thrombus in the external iliac artery was 17 cm. in length and occluded the bifurcation of the common femoral artery. It was thought that the most distal part of this thrombus at the origin of the profunda represented an embolus, probably a portion of the aortic one, which had broken off and lodged in the femoral artery. The location of the emboli and the thrombi are shown diagrammatically in Figure 6.

The chief significance of these findings was that despite the fact that the embolism occurred ten days previously, the secondary thrombus formation distal to the emboli was checked by the treatment administered. The initial vasoconstriction in the arteries distal to the site of embolism was counteracted for several hours by paravertebral novocain injection about the lumbar sympathetic ganglia. During this time and subsequently, an active circulation of blood through these vessels was enhanced by the use of the negative-positive-pressure apparatus.

The post-mortem findings indicated that this type of treatment, if administered early, aids the development of the collateral circulation around the site of embolism. In addition, by maintaining a blood flow of sufficient volume and rapidity, intra-arterial clotting distal to an embolus does not take place to a sufficient degree to jeopardize the life of the affected limb. It is probable that secondary thrombosis distal to the embolus may occur, but that it is limited to a segment of the arterial tree in which there is apt to be stagnation of the blood. Thus, it will be found to be present between the embolus and the point where the blood re-enters the main arterial channel through collateral blood vessels. This point is especially well illustrated in this case in the right extremity in which the secondary thrombus extended distally to just above the origin of the deep epigastric artery, through which, presumably, blood entered the femoral artery by way of the arteries of the anterior abdominal wall. From an examination of the specimen it should also be noted that no thrombus was found proximal to the embolus at the bifurcation of the aorta.

Conclusions

From the analysis of these cases of peripheral embolism in which the postembolic findings are considered typical, the following generalizations may be made.

Marked peripheral vasoconstriction of the arteries distal to the site of an embolism uniformly occurs very soon after the lodgment of the embolus. In one case it was noted within an hour and a half. The artery proximal to the embolus, on the other hand, is not affected to the same degree: it maintains its normal caliber except for a very short zone of constriction adjacent to the embolus. The peripheral vasoconstriction plays an important role in the formation of the secondary distal thrombus, which nearly always forms after the lodgment of the embolus, if early adequate treatment is not instituted.

A thrombus may form distal to an embolus as early as nine hours after the occurrence of the embolism. By then it may be so extensive as to prevent the return of the circulation to the extremity, even though the embolus and a considerable portion of the thrombus are removed.

Thrombus formation proximal to the embolus does not form so extensively as that distal to the embolus. Even after seventy hours in one case, it was only 3 cm. long. It can readily be removed. It is less likely than the distal thrombus to interfere with the collateral circulation, because usually it extends only up to but does not occlude the first major arterial branch proximal to the embolus.

The presence of a distal thrombus virtually precludes the return of circulation to the extremity, because it is impossible, even if the main artery is cleared of blood clot, to remove the thrombus from the smaller tributaries of the peripheral arteries.

Failures in the treatment of peripheral embolism can in most cases be directly attributed to the formation of a secondary thrombus distal to the embolus.

Restoration of the circulation following peripheral embolism can be brought about by means of early (within six hours) adequate treatment, such as embolectomy or the use of intermittent venous congestion therapy, and the interruption of the sympathetic pathways by novocain or alcohol paravertebral lumbar injection. In conjunction with these forms of treatment, the intravenous use of heparin should prove of value in preventing the distal secondary arterial thrombosis.

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THE COMPARATIVE PROTHROMBIN RESPONSES TO VITAMIN K AND SEVERAL OF ITS SUBSTITUTES IN A CASE OF NONTROPICAL SPRUE*

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RECENTLY Butt, Snell and Osterberg[1] and Engel[2] have found that prothrombin deficiency may appear in nontropical sprue. The reduction of plasma prothrombin in sprue presumably represents a general impairment in the absorption and utilization of fats and fat-soluble substances, including the fat-soluble vitamin K. It is the purpose of this report to present a case of nontropical sprue that developed a severe hemorrhagic tendency, which was completely relieved by the administration of vitamin K or some of its substitutes. This case is of interest in that the intermittent use over an eight-month period of several substances possessing vitamin K activity afforded an opportunity to compare the relative antihemorrhagic values of these substances in the same patient.

This case was presented in detail elsewhere by Childs and Dick[3] before these prothrombin studies were made. The early history is referred to only briefly in this report.

Case Report

A 31-year-old white, married woman was admitted to the Billings Hospital, October 29, 1937, on the medical service of Dr. George F. Dick. During the 3 years preceding admission she experienced marked loss of appetite, increasing weakness, glossitis and voluminous pale tan stools, foul in odor and occurring typically during the morning hours. The weight gradually fell from 126 to 92 pounds during this period.

On admission to the hospital the patient was found to have a macrocytic anemia that responded slowly to iron and liver extracts. Ecchymotic subcutaneous areas were present over the body and extremities; these were not affected by the administration of synthetic vitamin C until the general condition improved several weeks later. Pancreatic juice, obtained from dogs with bile fistulas, was provided by Dr. Lester R. Dragstedt of the Department of Surgery of the University of Chicago; it seemed to exert a definite therapeutic effect on the stool weight, its fat content and the frequency of bowel movements. Stool cultures were negative for monilia after incubation for 11 days. Fat-tolerance tests yielded a flat curve whether the test material was given in water or in pancreatic juice.

X-ray evidence of edema of the jejunum, terminal ileum and colon was found.

The patient was discharged March 4, 1938, improved, but was readmitted 3 weeks later complaining of sensations of numbness and tingling in the hands and feet, associated with some recent weight loss. A moderate anemia was again present, and a blood calcium of 6.2 mg. per 100 cc. was found. The patient was given a course of liver extract and daily oral doses of 3.0 gm. of calcium gluconate, 0.2 gm. of ferrous sulfate, 4.0 gm. of Armour's pancreatin, 3 ABD capsules, 3.6 gm. of brewer's yeast and 0.075 gm. of synthetic vitamin C. Improvement was rapid, and she was discharged 1 month later, continuing the above-mentioned medications and a diet containing 150 gm. of carbohydrate, 85 gm. of protein and 140 gm. of fat. The course on this regime at home was satisfactory until January, 1939, when the taking of liver extract and pancreatic substance was discontinued for a few days. By February 8 the glossitis had returned, the patient was having frequent bouts of epistaxis, and stools were being passed three or four times daily.

The patient was readmitted on February 16, and a regime similar to the previous hospitalization was instituted. Improvement was slow, and she was discharged again on May 20 on a diet containing 200 gm. carbohydrate, 175 gm. protein and 90 gm. fat. At home she continued to take the same medicinal agents with the daily addition of 20 drops of Drisdol and 0.001 gm. of nicotinic acid; on weekly visits to the clinic she was given 3 cc. of Lederle's liver extract concentrate intramuscularly, and 0.05 gm. of thiamin chloride intravenously.

The general condition on this regime was satisfactory except for the reappearance of bleeding gums and ecchymosis in July. This hemorrhagic tendency increased, and the menstrual flow in August was extended to 11 days instead of the normal 3 or 4. On September 6, the patient was once more readmitted in an effort to control the bleeding. The prothrombin concentration was 15 per cent of normal, as determined by a modified one-stage technic.[4] Alfalfa concentrate (Abbott)[5] was then given in doses of 2 cc. four times daily. The prothrombin elevation was sluggish, but after 4 days a level of 38 per cent was reached, after which no bleeding occurred. A prothrombin value equivalent to the normal control (100 per cent) was obtained by the 17th day. The alfalfa concentrate was then discontinued, and the patient was discharged on September 25. The prothrombin level was periodically checked and by November 7 had fallen to 33 per cent of normal, at which time several ecchymotic areas appeared. Alfalfa concentrate was again given in similar dosage for 14 days before a normal prothrombin value was re-established. On November 21, the dose of concentrate was reduced to 2 cc. daily for a 2-week period, but on this quantity the prothrombin level slowly fell. The concentrate was then discontinued, and weekly prothrombin determinations were made until February 7, 1940, when the patient again exhibited numerous ecchymoses and bleeding gums. A vitamin K substitute, 2-methyl-1,4-naphthoquinone (Lilly), administered orally in doses of 2 mg. four times a day without bile salts, produced a normal prothrombin level in 13 days; this substance was then discontinued. By March 31 the prothrombin level had fallen to 43 per cent of normal. This deficiency was treated by giving a sulfonated derivative of the 2-methyl-1,4-naphthoquinone by vein in doses equiv-

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alent to 12 mg. of the latter once daily on March 21, 23 and 25. By March 27 the prothrombin value was normal.

No further vitamin K therapy was given until April 13, when a prothrombin concentration of 60 per cent was found. At this time 2-methyl-3-phytyl-1,4-naphthoquinone (Merck), identified as synthetic vitamin K_1,[6] was administered in peanut oil in doses of 2 mg. four times daily without bile salts. In spite of the uninterrupted use of this substance the prothrombin continued to fall slowly over a 12-day period. By April 25, when it had reached 38 per cent, this substance was discontinued, and the 2-methyl-1,4-naphthoquinone derivative was again employed in daily oral doses of 8 mg. The prothrombin level again began to rise, reaching normal after fourteen days, a response quite comparable to the earlier course with this substance.

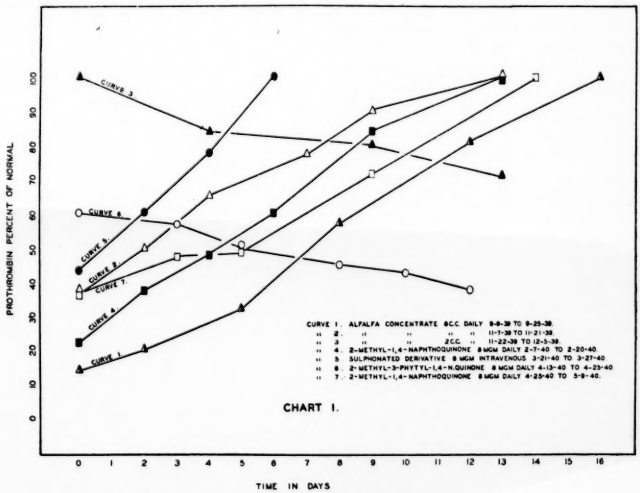
PROTHROMBIN PERCENT OF NORMAL
TIME IN DAYS
CURVE 1
CURVE 2
CURVE 3
CURVE 4
CURVE 5
CURVE 6
CURVE 7
CURVE 1. ALFALFA CONCENTRATE 8 CC DAILY 9-9-39 TO 9-25-39
" 2. " " " " 11-7-39 TO 11-21-39.
" 3. " " " 2 CC. " 11-22-39 TO 12-5-39.
" 4. 2-METHYL-1,4-NAPHTHOQUINONE 8 MGM DAILY 2-7-40 TO 2-20-40
" 5. SULPHONATED DERIVATIVE 8 MGM INTRAVENOUS 3-21-40 TO 3-27-40
" 6. 2-METHYL-3-PHYTYL-1,4-N.QUINONE 8 MGM DAILY 4-13-40 TO 4-25-40
" 7. 2-METHYL-1,4-NAPHTHOQUINONE 8 MGM DAILY 4-25-40 TO 5-9-40.
CHART 1.

FIGURE 1. *Prothrombin Responses to Vitamin K and Three of Its Substitutes.*

DISCUSSION

It is now well established that the absorption of fat-soluble vitamin K is essential for the elaboration of prothrombin by the liver.[7] Thus any defective absorption of the vitamin or any impairment of the production of prothrombin by the liver may lead to prothrombin deficiency. The lowered prothrombin in cases of obstructive jaundice is due primarily to impaired absorption of fat-soluble vitamin K. The prothrombin response to this vitamin in obstructive jaundice is exceedingly rapid once the absorption defect has been corrected by the administration of bile salts. In patients whose prothrombin deficiency results from cirrhosis the response to the vitamin is sluggish or entirely lacking.[8]

It is generally agreed that in sprue the excessive excretion of fat is due to poor absorption, but it is possible that other factors may be involved.[9] The malabsorption of fat in this disease presumably could give rise to prothrombin deficiency by diminishing the absorption of fat-soluble vitamin K. However, the slow response of prothrombin to both the oral and parenteral administration of the vitamin and its substitutes in the case reported here suggests that the prothrombin deficiency was due to impairment of the hepatic elaboration of prothrombin as well as to poor absorption of the vitamin. No other evidence of liver insufficiency was found.

The antihemorrhagic therapy included the following courses: alfalfa concentrate (natural vitamin K_1), two courses; 2-methyl-1, 4-naphthoquinone, two courses; an aqueous soluble sulfonated 2-methyl-1, 4-naphthoquinone, one course (given parenterally); and 2-methyl-3-phytyl-1, 4-naphthoquinone (synthetic vitamin K_1), one course. The prothrombin response to each of these substances is graphically illustrated in Figure 1. In considering the antihemorrhagic values of these various substances, Fernholz and Ansbacher[10] have recently stated that the potencies of the naturally occurring and the synthetic (2-methyl-3-phytyl-1, 4-naphthoquinone) vitamin K_1 are essentially equivalent when compared in doses of equal weight; the 2-methyl-1, 4-naphthoquinone is approximately four times as potent as either of these

substances. One cubic centimeter of the alfalfa concentrate employed in this study is said to contain a quantity of natural vitamin K_1 equivalent in activity to 1 mg. of 2-methyl-1, 4-naphthoquinone.[5]

When 8 cc. of the alfalfa concentrate or 8 mg. of the 2-methyl-1, 4-naphthoquinone was given in this case, the prothrombin responses, as expected, were quite similar. However, when 8 mg. of the synthetic vitamin K_1 was administered, the prothrombin actually fell from its pretherapeutic level of 60 per cent to 38 per cent over a thirteen-day trial period. The failure of this substance to elevate the prothrombin was undoubtedly due to the low dose, which obviously was only equivalent to 2 mg. of 2-methyl-1, 4-naphthoquinone. At the end of this test period an 8-mg. daily dose of 2-methyl-1, 4-naphthoquinone was substituted for the synthetic vitamin, and in response to this substance the prothrombin rose to normal over a fourteen-day period. A maintenance dose of 2 cc. of the alfalfa concentrate, a quantity equivalent to 8 mg. of the synthetic vitamin K_1, was also ineffective in preventing a decline in the prothrombin level. The activity of the sulfonated compound given intravenously cannot be compared with the potencies of the compounds that were administered orally.

Conclusion

It can be concluded from the studies on this patient that natural (alfalfa concentrate) and synthetic (2-methyl-3-phytyl-1, 4-naphthoquinone) vitamin K_1 were considerably less active than the 2-methyl-1, 4-naphthoquinone.

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THE SYMPTOMATIC TREATMENT OF FUNCTIONAL DYSMENORRHEA BY AMPHETAMINE (BENZEDRINE) SULFATE*

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In a practice including a high percentage of young women patients, the problem of the treatment and management of dysmenorrhea becomes extremely important. In some cases painful menstruation is a sign of underlying organic disease or hormone dysfunction. However, there remain a certain number of sufferers from dysmenorrhea in whom careful gynecologic examination and laboratory investigation reveal no such cause. The pain is often so severe that bedrest during part of each menstrual period becomes necessary. In such cases the efficiency of the patient is markedly reduced, not only by pain but also by the marked depression that is usually a factor. This psychologic component of dysmenorrhea is also usually found in cases in which abnormal conditions are present in the uterus or in its nerve supply. Although the pain can to some extent be controlled by salicylates or codeine, the treatment by such methods has not been entirely satisfactory in controlling the depression, fatigue and inertia.

It was thought possible that a therapeutic agent causing relaxation of smooth muscle in general, and at the same time an increase of the sense of well-being, might be of value in the treatment of functional dysmenorrhea. For this reason amphetamine (Benzedrine) sulfate was tried.

Halpern[1] showed that amphetamine sulfate could be considered a physiologic antagonist of such spasmogenic drugs as acetylcholine and pilocarpine when acting on the uterus of the rabbit. Boyd,[2] on the other hand, presented evidence that on isolated uterine muscle of the rabbit, amphetamine sulfate produced increasing contraction. Hundley et al.[3] found that the drug contracted uterine muscle strips in the guinea pig but relaxed them in the rabbit, and that whether it was injected

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into living persons or applied to surviving human uterine muscle strips, the predominant effect was an increase of uterine tone and a diminution of the amplitude of contractions.

Bakacs,[4] who treated climacteric symptoms with amphetamine sulfate, reported improvement of menstrual disorders in certain cases. Hundley et al.[3] had good results administering 10 to 20 mg. amphetamine sulfate to relieve attacks of primary dysmenorrhea in a series of 91 working girls.

Since amphetamine sulfate has been successfully used for dysmenorrhea in the author's practice for three years, it seemed interesting to publish the records of 4 typical cases that were thoroughly studied and controlled. The cases were chosen from a series of 34, and were the most serious seen during the three-year period of observation.

Method

A complete medical history was obtained and a physical examination made in each case, and 3 patients were referred to consulting gynecologists. In no case was any underlying gynecologic disorder responsible for the dysmenorrhea. Glandular dysfunction and organic lesions, when present, were treated appropriately before beginning treatment with amphetamine sulfate.

The patients were given three trial doses of 2.5, 5.0 and 10.0 mg. amphetamine sulfate during intermenstrual periods, and were observed for an hour in order to determine whether or not any sensitivity to the drug or untoward reactions would occur. A sufficient quantity of the drug for the next menstrual period was then given, without comment on the nature of the medication. The patients were instructed to take 10 mg. (one tablet) of amphetamine sulfate before breakfast for two days before the expected period and including the day of the period, and to repeat the dose if the pain was not relieved. They were not permitted to take more than 20 mg. a day, or to take the second tablet after 2 p. m., without advice from the physician. The treatment lasted three or four days, depending on the expected duration of symptoms. On alternate periods the patients were given placebos or analgesics (salicylates or codeine), but they did not know what medication they were receiving. No leading questions were asked, but the patients were asked to describe the symptoms at each menstrual period. The various findings were later correlated.

Case Reports

Case 1. A 27-year-old patient stated that her periods began at the age of 12 and recurred regularly every 28 days, lasting 2 or 3 days and requiring one or two pads a day. From the onset there were symptoms of dysmenorrhea, with marked aggravation since 1926, the year before her marriage. The dysmenorrhea usually started 1 week before the period, confined the patient to bed until the flow had ceased and was characterized by severe low abdominal and back pain, bearing-down in nature but without radiation and without leukorrhea or intermenstrual bleeding. The condition was complicated by an anxiety depression, with financial worries, which resulted in maladjustment.

The patient was married in 1927. In May, 1931, a normal-sized baby was delivered by cesarean section, necessitated by the presence of a small pelvis. Pregnancy had been difficult.

In June, 1935, the patient complained of constant pressure and a heavy feeling in the pelvis, for which she was treated by douches and tamponage. The next two periods were unusually profuse, suggesting the possibility of endometriosis, but this was not found by the gynecologist to whom she was referred.

Examination in January, 1936, revealed a marked hypochromic anemia and hyperthyroidism, with a basal metabolic rate of +39 per cent. Thyroidectomy was performed in March, after which the basal metabolic rate fell to normal and the symptoms of hyperthyroidism disappeared. The anemia was successfully treated with ferrous sulfate.

The dysmenorrhea was not in any way relieved by pregnancy or by thyroidectomy, and menstrual pain was the chief complaint. The patient was referred for complete gynecologic examination, but no positive findings were obtained. Administration of 2000 international units of Theelin daily for five months, beginning in January, 1937, caused no improvement. Analgesics were also ineffective, and the patient became more depressed with each period.

Amphetamine sulfate therapy was begun in December, 1937. A dose of 10 mg. gave marked relief of pain and a general increase in the sense of well-being, but it was found that repetition of the dose 3 hours later gave even better results. The patient remained in bed for 2 or 3 hours after taking the drug, and was then able to get up and to carry on her work, both as a housewife and as a saleswoman. The medication has been uniformly successful for 2 years. The substitution of placebos or salicylates always resulted in a return of the original symptoms of pain, depression and incapacity.

Case 2. A 16-year-old single girl reported that menstruation started at the age of 14 with a normal amount of flow, usually lasting 3 or 4 days. Dysmenorrhea began at the onset of each period, with lumbar and low abdominal pain that was bearing-down and cramplike in character and radiated down both legs. Each attack was associated with nausea and vomiting, chills and a clammy skin with marked pallor. The patient had what appeared to be a marked vasomotor reaction with each period and was always confined to bed during the 1st day.

Physical examination and history were essentially negative, aside from a slightly masculine distribution of hair and the complaint of dysmenorrhea. In view of a basal metabolic rate of −10 per cent, the patient was given 2 gr. of thyroid daily for a period of 4 months. This therapy diminished the nausea and vomiting and also relieved the cramps to a certain extent, but the relief was not sufficient to enable her to be up during the 1st day of her period.

Thyroid was discontinued in September, 1938. Ten milligrams of amphetamine sulfate was given daily from the expected onset of menstruation until the morning of the 2nd day of the period. There was almost complete relief from all symptoms, except when menstruation started before the amphetamine sulfate was given, but at such times the drug brought complete relief. The nausea and

vomiting and the peculiar skin sensations were completely abolished, and the patient was able to go to school without interruption. When placebos, salicylates or codeine were substituted, all the symptoms returned. The medication has continued for a year, with no signs of tolerance. Thyroid was later added to the treatment because of evidence of mild hypothyroidism. During the last two months the patient has received a combination of thyroid and amphetamine sulfate, beginning one week before the expected period, with excellent results.

Case 3. The menstruation of a 32-year-old married woman began at the age of 11 and recurred every 30 days with a normal amount of flow. Dysmenorrhea, characterized by severe low abdominal pain, appeared at the onset of the menses, and necessitated bed rest the first half-day of the period. When dysmenorrhea did not occur there was an attack of migraine for 2 days previous to the onset of menstruation. During all periods the patient felt uncomfortable and markedly depressed and fatigued. Pregnancy 3 years before the first visit had brought no relief of the dysmenorrhea, although codeine alleviated the pain to some extent.

Physical and gynecologic examinations were essentially negative, except for the presence of a small fibroid.

Amphetamine sulfate was found to give relief from pain and depression, beginning a half-hour after ingestion and becoming complete in 2 hours. Five to 7.5 mg. were sufficient in this case, whereas 15 mg. or more occasionally produced tachycardia which lasted for 30 minutes. Substitution of placebos resulted in the return of the symptoms.

Case 4. The onset of the menses in a 17-year-old girl was at 14 years, and they recurred at intervals of 4 to 5 weeks thereafter. The amount and duration of the flow were normal. There was dysmenorrhea from the beginning, occurring 2 or 3 days prior to the period, with generalized aching and low abdominal pain and with nausea and vomiting on the 1st day of the flow. The pain lasted about 2 days, but usually recurred on the 5th or 6th day. There was no constipation, but usually a looseness of the bowel movements. Soreness of the breasts was present just before the period. The pain and depression obliged the patient to remain away from school during attacks.

Physical and gynecologic examinations were essentially negative except for the presence of a femoral hernia, which gave little difficulty.

A daily dose of 5 mg. of amphetamine sulfate was sufficient to control all symptoms in this patient, enabling her to attend school without interruption for 6 months, except when incapacity resulted from the substitution of placebos.

The observations included a group of 30 additional patients. Of these, 20 were studied for a period of four months or more. In 4 cases dysmenorrhea did not occur while under medication, and 7 patients reported complete relief of symptoms within 2 hours of taking the drug. Twelve patients reported marked relief of symptoms and an increased sense of well-being, and 5 reported that the relief was not sustained; 2 believed that their symptoms were, if anything, worse.

In the total group of 34 patients there were only two untoward reactions. The first was a manic phase induced by a test dose of 5 mg. of the drug in a patient who later was proved to have a manic depressive psychosis. The second was in a patient with anxiety neurosis who refused medication because palpitation occurred with the test dose. In the entire series there was no indication of tolerance or habit formation. No patients expressed a desire for the drug in intermenstrual periods.

Amphetamine sulfate was not observed to have any effect on the amount of menstrual flow.

Discussion

Amphetamine sulfate is not suggested as a remedial measure for dysmenorrhea in the presence of underlying pathologic conditions. Prior to any symptomatic treatment, competent gynecologic examination should of course be made, and indicated measures taken; when a positive diagnosis of endocrine dysfunction is made, appropriate therapy should be undertaken. But it is significant that the symptoms of dysmenorrhea often fail to yield to such treatment. An example is seen in Case 1. This patient was generally benefited by thyroidectomy and Theelin medication, but the dysmenorrhea was not relieved. The symptomatic improvement must be attributed to one or more of the various effects of the drug, that is, improvement of mood, relief from fatigue and relaxation of smooth muscle. The implication is that cases of essential dysmenorrhea have too frequently been ascribed to some unspecified endocrine imbalance, whereas endocrine disorders and essential dysmenorrhea should be treated independently.

It is impossible to determine what part was played by the relief of spasm and pain through the relaxation of smooth muscle, but it seems probable that the disappearance and prevention of abdominal pain may be partly attributed to this effect of the drug.

The most demonstrable value of amphetamine sulfate was in the relief of depression and fatigue. This effect may in turn have favorably influenced other symptoms, such as nausea, which are often psychogenic. That this effect was real, and not imaginary, is proved by the fact that substitution of placebos never failed to cause a recurrence of the symptoms.

Objections to this treatment in ambulatory patients are based on the possibility of reactions, tolerance and habit formation. Reactions were forestalled by test doses, and in the rare cases in which they occurred subsequently, could be controlled by reducing the dose. Tolerance was not developed, nor could it be expected under spaced medication of this type: the dosage never had to be increased during the three years of the experiment. Medication was never requested during intermenstrual periods; the patients in whom fa-

vorable responses were obtained wanted the drug for its specific effect in relieving their symptoms, but never seemed desirous of obtaining the euphoric effect when it was not recommended for their condition.

Summary and Conclusions

Amphetamine (Benzedrine) sulfate, in doses of 5 to 20 mg. a day, was used in the treatment of 34 cases of essential dysmenorrhea. Four of these were studied in detail. It was found that the drug relieved pain, fatigue and depression in cases in which other measures had failed. This finding was confirmed by the substitution of placebos or other medication during alternate periods. The rationale of the therapy is discussed.

In the 30 additional cases, 40 per cent obtained complete relief and an equal number moderate relief. In 16 per cent the apparent benefit of the drug was not maintained, and in 2 cases (6 per cent) the patients reported that they were worse under medication.

It is concluded that amphetamine sulfate is a valuable drug for the treatment of dysmenorrhea and that it is well adapted to ambulatory patients.

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MEDICAL PROGRESS

MEDICAL ASPECTS OF OBSTETRICS

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During the last twelve months various contributions to the literature dealing with the medical phases of obstetrics have appeared. As usual, the knowledge of such progress as has been made must be gleaned from observations and opinions, which at times confirm and at other times refute observations previously made and opinions previously expressed.

The toxemias of pregnancy have claimed their usual share of attention, with a continuing contest between etymologists and etiologists concerning a proper system of nomenclature. The latter school of thought contend that the very existence of so-called "toxemia of pregnancy" is doubtful. Peters et al.[1, 2] state that toxemic pictures may resemble all the disorders that outside of pregnancy give rise to arteriolar disease, hypertension and functional impairment of the kidneys. Pyelitis, in their opinion, plays an important part because the physiologic hydronephrosis of pregnancy renders infection particularly malignant. According to them, women who have pyelitis when pregnant seldom escape irreparable and enduring damage if the pregnancy is allowed to continue. In support of this belief they report finding among 93 women with pyelitis as a complication of pregnancy 25 cases of hypertension or edema or both before pregnancy was terminated. Weiss and Parker[3] conclude that chronic pyelonephritis results in the gradual diminution of kidney structure and in decreased renal function, and state that patients who have had pyelonephritis in early childhood show a marked tendency to develop a certain type of toxemia.

The role of renal damage from a pre-existing pyelitis or pyelonephritis in the etiology of the toxemic syndrome is discussed by Crabtree and Reid.[4] These authors consider that early interruption of pregnancy because of the occurrence of pyelitis or pyelonephritis, as advocated by Peters, requires further investigation before being accepted. They report a series of 45 cases of pregnancy pyelonephritis in which the infection had occurred from five to ten years before the investigation was undertaken. In their conclusions they state that data have not yet been produced to indicate to what extent pyelonephritis of pregnancy shortens life; though in many cases it is a progressive disease, and though a high percentage of patients suffer appreciable damage to their kidneys, which is demonstrable from five to ten years after the infection, they believe that sufficient evidence has been produced to indicate that the aim in treatment in pyelonephritis associated with pregnancy should be to minimize the initial injury and clear the infection as soon as possible.

Mussey and Lovelady[5] review the relations of urinary infection to toxemia, comparing a series of 117 proved cases of pyelitis complicating preg-

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nancy with a series of 163 cases of acute hypertensive toxemia of late pregnancy. Ninety-two patients in the former group showed pyelitis during pregnancy, 25 in the puerperium. In 3 patients, pyelitis of pregnancy was followed or accompanied by the development of acute toxemia. One patient with fulminating pyelonephritis died of acute renal failure probably associated with cortical abscesses; permission for necropsy was not obtained, and it is debatable whether or not this case should be classed as a true pre-eclamptic toxemia. None of the 163 patients in the toxemic group gave a history of pyelitis prior to the first pregnancy; in 6 cases pyelitis developed during the puerperium. The authors conclude that acute pyelitis of pregnancy when treated promptly is not prone to cause pre-eclamptic toxemia, and that following one attack of acute pyelitis of pregnancy the majority of such women do not exhibit symptoms of residual renal damage.

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Such studies as those quoted in the two preceding paragraphs are in no sense contradictory to the findings of Peters and of Weiss and Parker that renal damage found at autopsy may frequently be traceable to a previous severe or long-standing infection. In fact they show, by clinical observation, that functional damage to the renal and vascular systems occurs following a certain proportion of cases of pyelitis and pyelonephritis. To date, however, they have not proved that these conditions are certain to cause renal damage within the space of the childbearing period of life, or that the occurrence of pyelitis or pyelonephritis in pregnancy is per se an indication that interruption of the pregnancy is indicated as the cardinal treatment to be employed.

Tenney and Parker[6] take issue with the usually accepted belief that hypertension, edema and albuminuria occurring in a pregnant woman necessarily justify a diagnosis of toxemia. They maintain that true toxemia, whether or not there is underlying or pre-existing hypertension or renal disease, can be accurately judged by certain changes in the placenta, which they describe as widespread hyaline syncytial degeneration associated with marked villous congestion. This claim leaves the clinician in a dilemma when he is confronted with a pregnant woman presenting the aforesaid triad of hypertension, edema and albuminuria. Since, according to this concept, the means of diagnosing true toxemia — to wit, the placenta — is unavailable until after the uterus has been emptied by natural or induced means, the primary diagnosis seems to be narrowed down to a choice between hypertensive disease and renal disease, neither of which can be proved without prolonged study and observation, unless one is to postulate the existence of false as well as true types of toxemia. Further discussion along this line, however, might become Gilbertian, since the term "toxemia" still eludes concrete definition, useful though it may be as the name of a syndrome.

Despite controversy as to etiology, the etymologists have not been entirely inactive. Wellen[7] discusses a workable classification for the so-called "toxemias of pregnancy" that differs only in slight detail from the classification agreed on by a subcommittee of the American Committee on Maternal Health. The latter includes the following headings: vomiting of pregnancy, acute yellow atrophy of liver, eclampsia, severe pre-eclampsia, mild pre-eclampsia, hypertensive disease, and renal disease. To this classification Stander,[8] previously a formulator of the Johns Hopkins classification, which was partially discussed in this review[9] in 1939, has given approval, correlating his original concept of low-reserve kidney with mild pre-eclampsia and hypertensive disease, and his original grouping of chronic nephritis with hypertensive disease and renal disease.

Reid and Teel[10] have contributed an article dealing with cardiac asthma and acute pulmonary edema complicating the toxemias of pregnancy, complementary to an article on the same subject published by the same authors and Hertig[11] in 1937. They find that both toxemic patients with previously normal vascular and renal systems and those with antecedent hypertension may have paroxysmal attacks of cardiac asthma with acute pulmonary edema; they attribute these conditions to sudden left-ventricular failure. Therapy consists in large doses of morphine with venesection, or in peripheral venostasis when indicated by severe pulmonary edema, followed by rapid digitalization and dehydration, and delivery within a few days after the attack has been controlled. The authors also believe that the distressing pulmonary edema often encountered in severe and fatal eclampsia is a result of acute left-ventricular failure; for this reason rapid and full digitalization of all eclamptic patients is indicated.

For the treatment of eclampsia, veratrum viride has been reintroduced, this time from the Ohio Valley. In 1935 Bryant,[12] of Cincinnati, reported a series of 121 consecutive cases treated with this drug, with 12 deaths, a mortality of 10 per cent. During the last year Bryant and Fleming[13] have published a new series of 120 cases thus treated, 54 of which had been included in the 1935 paper; two deaths occurred, a mortality of 2 per cent. In addition to veratrum viride, however, which serves as a vasodilator, slowing the pulse and lowering

the blood pressure, the authors advocate the administration of 10 cc. of 50 per cent magnesium sulfate by deep injection immediately after the condition is recognized, followed by 5 cc. every six hours for four doses and by 5 cc. every twelve hours thereafter for four more doses; this drug they consider to have a dehydrating and diuretic action. In July, 1940, treatment with veratrum viride was instituted at the Boston Lying-in Hospital, with the intention of using this drug, if feasible, without the synergistic action of magnesium sulfate, according to the standard recommended by the Cincinnati investigators, *viz.,* 10 minims at once, repeating the dose every ten or fifteen minutes until the pulse rate is below 60 or the systolic blood pressure below 120; thereafter repeating in doses of 3 to 10 minims if the pulse rate exceeds 80 or the blood pressure rises above 150 systolic. To the date of publication of this report, however, insufficient evidence has accrued locally to render a judgment as to the results to be expected.

Progress in the employment of chemotherapy for puerperal and postabortal infection has been reported from various sources. Gordon and Rosenthal[14] investigated 27 new cases of severe puerperal infection; 21 showed clinical response to sulfanilamide therapy, 5 gave a doubtful response and 1 gave no response. They state that sulfanilamide therapy in severe infections need not wait upon bacteriologic investigation, yet this information is of importance in deciding whether the drug should be continued in the absence of favorable clinical response. So far as these authors know, all strains of Group A streptococcus respond to sulfanilamide, but evidence in the cases of infection by anaerobic streptococci, *Streptococcus viridans,* nonhemolytic streptococci, staphylococci and colon bacilli is inconclusive.

Rosenthal and Stone[15] reporting 2 cases of vegetative endocarditis due to hemolytic streptococci (Groups B and C), one postabortal and the other probably postpartal, found that massive sulfanilamide therapy failed in both cases, and that experiments in vitro and in vivo indicated the drug had little effect on these strains.

These observations bear out reports from other sources, both obstetric and nonobstetric, that sulfanilamide has its greatest value in the treatment of infections with the Group A hemolytic streptococcus. They add evidence to previous experience that bacteriologic control is necessary if the best results are to be expected from chemotherapy. Sulfanilamide may properly be used in severe infections pending bacteriologic confirmation of the identity of the organism involved, and may be continued if culture shows the organism to be of a type against which the drug has been shown to have therapeutic value, especially the Group A streptococcus, or, despite the doubts of Gordon and Rosenthal,[14] the colon bacillus. If an anaerobic streptococcus is shown to be the agent of infection, sulfanilamide is probably valueless; if the staphylococcus is found, sulfathiazole therapy promises much more favorable results.

Long et al[16] have contributed a concise and informative article dealing with the toxic manifestations of sulfanilamide and its derivatives. Whereas heretofore the careful clinical and laboratory investigation of patients treated with sulfanilamide, sulfapyridine or sulfathiazole has been considered necessary, the authors are now willing to state that, with the exception of acute leukopenia, all the toxic manifestations of these drugs, which may occur in the first two weeks of therapy, can be recognized by careful clinical observation alone; therefore they believe that no physician need hesitate to administer the drugs in therapeutically adequate amounts, provided he can see his patient once a day. The requisite observations include the following:

> Inquiry as to symptoms of headache or malaise, because these symptoms often precede toxic manifestations.
>
> Examination of the scleras for jaundice, the mucous membranes for pallor and the skin for rash.
>
> Checking of temperature to discover drug fever. If the patient complains of chills, it should be arranged to have the temperature recorded frequently.
>
> No special precautions are required as to the urine when sulfanilamide is used. It should be measured by any household standard in all cases receiving sulfapyridine or sulfathiazole. In this way an oliguria may be detected before anuria develops. The urine should always be examined for gross blood, and the attendants should stop the drug and force fluids if oliguria develops or if the urine looks bloody.
>
> Before instituting therapy it is important to ascertain whether the patient has taken sulfanilamide or a related drug before, and if so, whether it proved toxic. If a history of toxicity is obtained, it is best to give a small test dose (5 gr.) and to observe the patient closely before cautiously beginning chemotherapy.

This article is of considerable value in dispelling the natural uncertainty as to the advisability of chemotherapy when complete laboratory control is impossible or inexpedient. The observation of gross blood in the urine is misleading in postpartal or postabortal patients unless the specimen is obtained by catheter; hence under conditions of therapy in the home the fourth precaution mentioned by the authors above quoted may be difficult to fulfill in such cases. Fortunately, the greatest part of postpartal and postabortal sepsis is due to organisms for which sulfanilamide is indicated. The smaller group of cases in which sulfapyridine or

sulfathiazole is the agent of choice should be hospitalized, whenever possible, in the interests of better-controlled observation and greater safety for the patient.

Perhaps the most publicized element of progress in the medical aspects of obstetrics during the last year has been the attention directed toward the use of vitamin K both prophylactically and therapeutically in hemorrhagic disease of the newborn.

It has long been recognized that a newborn infant may exhibit a certain hemorrhagic tendency during the first week or two of life, which results in some cases in death from rapid exsanguination. Bleeding may occur from the umbilical cord, from the gastrointestinal tract, beneath the skin, from the urinary tract or into the cerebrospinal system. This syndrome, recognized clinically as hemorrhagic disease of the newborn, is separate and distinct in etiology from the hemophiliac and purpuric types of diathesis, and its occurrence is limited predominantly to the first week, and practically always to the first two weeks of neonatal life. The only reasonably effective method of therapy known to date has been prompt transfusion with whole blood.

Evidence is rapidly accumulating that the blood of newborn infants shows a low level of prothrombin. Kato and Poncher[17] give a historical résumé of prothrombin determinations, referring to the previous publications of Quick and Grossman,[18] Brinkhous, Smith and Warner[19] and others, which had demonstrated low prothrombin levels in the blood of newborn babies. Kato and Poncher report the prothrombin clotting time, by a micromethod that they describe, of 173 newborn infants, both mature and immature. In 100 mature infants the average time was 43.2 seconds on the first day of life, gradually shortening to 25.0 seconds by the tenth day. In 73 premature infants the average figure of 46.5 seconds was found on the first day.

Waddell and Lawson[20] have investigated 191 newborn infants, showing that the period of most marked prothrombin deficiency occurred at the ages of forty-eight and seventy-two hours. This is in accord with the common obstetric experience that the bleeding tendency in otherwise normal newborn infants is apt to manifest itself on the second or third day after delivery.

Rush[21] compared the fibrinogen and prothrombin levels of samples of maternal and umbilical-cord blood taken at the time of delivery of 18 patients with the values found in 6 normal persons. The fibrinogen level of cord blood was found to be normal, but the prothrombin content was reduced. Both the fibrinogen and prothrombin contents of maternal blood at the time of delivery were found to be above normal. The conclusion reached was that the prolonged prothrombin clotting time of cord blood is not due to a deficiency of plasma fibrinogen. In a later article the same author, in collaboration with Norris,[22] substantiates his previous findings concerning the respective prothrombin contents of maternal and cord blood.

Enough of the available evidence has been quoted in the preceding paragraphs to indicate the chemical background for the tendency of newborn infants to bleed. Hemorrhagic disease is thus seen to be a deficiency disease. If an antidote is available to make good the deficiency, its administration should prevent the condition from developing and should have therapeutic value against its manifestations if perchance it should develop. The evidence secured to date suggests that vitamin K is such an antidote.

Cheney[23] states that hemorrhagic disease of the newborn is one of two classes of disorders definitely associated with vitamin K deficiency that are benefited by vitamin K therapy. Waddell and Lawson,[20] reporting the findings in 181 infants treated with 0.5 cc. of natural vitamin K concentrate, or its equivalent in 2-methyl-1,4-naphthoquinone, immediately after birth and at the end of twenty-four and forty-eight hours, and comparing them with those obtained in 191 control infants, conclude that such a regime will give adequate protection against the physiologic prothrombin deficiency characteristic of newborn life. Fitzgerald and Webster[24] report a study to determine the effect of vitamin K administered to women in labor. Fifty patients treated with oral Klotogen showed a definite rise in their prothrombin levels at the end of labor; there was also a definite rise in the average level of prothrombin in the cord blood. The same findings were obtained in 19 patients to whom the authors administered synthetic Vitamin K intravenously. A series of 20 cases in which sodium pentobarbital was given as an analgesic showed a definite depression of the prothrombin levels of both mothers and infants.

Hellman, Shettles and Eastman,[25] publishing a review of one year's experience with vitamin K in obstetrics, state that the plasma prothrombin level of the newborn infant can be raised severalfold by administering vitamin K to the mother antenatally, even when it is given as late as four hours before delivery; and that although the feeding of vitamin K to the baby after birth also increases its prothrombin concentration, the levels reached are not so high as those achieved by antenatal ad-

ministration to the mother. Comparing a series of 384 cases in which each mother was given 2 mg. of 2-methyl-1,4-naphthoquinone orally during labor with a control series not so treated, the authors determined that the incidence of thrombophlebitis in the mothers was not increased (owing to the increased plasma prothrombin) in the treated cases, and that the giving of vitamin K had no effect on maternal blood loss. Concerning the infants born in the two series, the former, treated with vitamin, showed 6 deaths, a mortality of 1.5 per cent; the latter, or control series, showed 16 deaths, a mortality of 4.1 per cent. Only 1 fatal case in the treated series showed hemorrhage (subarachnoid) at autopsy, whereas 9 of the 16 fatal cases in the control series showed hemorrhage at autopsy, 3 of which were cerebral, and 1 of which showed the classic syndrome of hemorrhagic disease of the newborn.

The following well-founded deductions are indicated in the authors' study:

Hemorrhagic diathesis in the newborn represents simply an extreme degree of hypoprothrombinemia which all newborn infants exhibit to a certain extent and in various gradations.

Unless the plasma prothrombin level is extremely low, this hypoprothrombinemia may be without clinical manifestations.

If birth trauma, anoxia and other causes of bleeding are superimposed upon it, this prothrombin lack must necessarily play a part in the duration and therefore in the extent of the bleeding.

It seems that routine antenatal administration of vitamin K, properly timed, and with suitable dosage, will well-nigh eliminate so-called "hemorrhagic disease of the newborn." Certain types of cerebral hemorrhage, particularly small hemorrhages that ooze for a number of days, may be preventable by this procedure.

The trend of recent reports, therefore, indicates that vitamin K concentrate, or the synthetic substance, 2-methyl-1,4-naphthoquinone, is a promising agent to be used in the effort to reduce mortality among newborn infants. As stated by the Baltimore investigators, the triad of anoxia, trauma and hypoprothrombinemia must be considered as malignantly allied factors in the causation and outcome of every case of bleeding in the newborn, whether cerebral or otherwise; and the hypoprothrombinemia is the one factor in this triad that is subject to prophylactic correction. From the therapeutic angle, however, the relative efficacy of administration of vitamin K and of transfusion of whole blood in cases of clinically evident hemorrhagic disease awaits elucidation.

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CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICOPATHOLOGICAL EXERCISES

FOUNDED BY RICHARD C. CABOT

TRACY B. MALLORY, M.D., *Editor*

CASE 27051

PRESENTATION OF CASE

A sixty-four-year-old man entered the hospital complaining of three attacks of upper abdominal distress.

Eight years before entry the patient had an attack of upper abdominal discomfort associated with general malaise, anorexia, nausea and vomiting. This lasted for four days, and gall-bladder studies at this time revealed a functioning gall bladder with a haziness of the shadow, "suggestive of sand." Except for slight gaseous eructation he was well until three years prior to admission, when he had a similar attack, which lasted for three weeks. X-ray studies were similar to those taken five years previously. At no time was there fever, jaundice or a change in the character of the stools. The third attack occurred six weeks prior to entry, and for the first time the patient noticed tenderness in the right upper quadrant of his abdomen. X-ray examination at this time showed an unusually large gall bladder filled with dense dye. There was an irregular-shaped area of calcification floating in the gall bladder, which sank to the bottom of the gall bladder in the upright position. There was no definite change in the size of the gall bladder after a fatty meal. Films of the gastrointestinal tract showed a small adhesive diverticulum in the middle third of the esophagus. The stomach showed no abnormalities; the pylorus opened readily. The duodenal cap showed marked swelling of its folds, but a definite crater was not demonstrable. There was no constant narrowing of the cap, and the remainder of the duodenum appeared normal. An x-ray film of the chest showed the diaphragm to be low in position, but normal in outline, with normal respiratory excursion. The heart shadow was slightly prominent in the region of the left ventricle; the aorta was slightly tortuous. The lung roots were normal in width and density, and the apical and peripheral portions of the lungs were clear. The lung markings in the basal portions were slightly prominent. An electrocardiographic recording showed normal sinus rhythm with a rate of 78, a PR interval of 0.16 second and a QR interval of 0.08 second; T_1 and T_2 were upright, T_3 flat and T_4 upright; left-axis deviation was well marked.

The upper abdominal discomfort and anorexia were still present at the time of admission. The patient lost 6 to 8 pounds in weight. In the past he had had frequent sore throats.

On examination the throat was reddened and edematous. Examination of the heart and lungs was negative; the blood pressure was 132 systolic, 72 diastolic. A definite sense of resistance with mild tenderness was present in the right upper quadrant of the abdomen.

The temperature, pulse and respirations were normal.

Examination of the urine was essentially negative. Examination of the blood showed a red-cell count of 5,100,000 with a hemoglobin of 17.5 gm. (photoelectric cell technic), and a white-cell count of 15,600 with 78 per cent polymorphonuclears. The nonprotein nitrogen of the blood serum was 20 mg. per 100 cc., the serum protein 6.4 gm. per 100 cc., and the chloride 115.5 milliequiv. per liter.

On the third hospital day an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. F. DENNETTE ADAMS: Customarily when I receive one of these protocols I spend hours trying to make a diagnosis. In this case I have spent even more time trying to avoid making one. At first glance this appears to be a simple case of gall-bladder disease — three attacks of upper abdominal distress with anorexia, nausea and vomiting, the last accompanied by tenderness and resistance in the right upper quadrant and presumptive roentgenologic evidence of stone in the gall bladder.

Yet a more careful analysis of the record introduces a not inconsequential element of doubt. The patient had very little discomfort in the first and second attacks. In none of the three was there pain characteristic of gallstone colic. Nor was there fever, pronounced tenderness or any other indication of acute gall-bladder infection. During the eight-year period he was always quite well between attacks. Complete interval freedom from symptoms is not inconsistent with chronic cholecystitis, yet a gall bladder diseased enough to cause three definite episodes might well be expected to create during the intervals at least a few spells of vague indigestion, flatulence or other minor digestive complaints. In the third attack the tenderness and resistance, in addition to the subjective symptoms, incline one to the diagnosis of gall-bladder disease, and in the pres-

ence of a positive roentgenogram, I should make that diagnosis.

But the roentgenologist's report clouds the issue. Before I ask Dr. Hampton to show the films let me speculate for a moment: the gall-bladder shadow is said to be large. A large gall bladder almost invariably results from one of two disorders — acute cholecystitis, especially when it is associated with stone in the cystic duct, a condition in which one expects definite systemic reaction, acute pain and tenderness, or tumor of the head of the pancreas or some other obstructive lesion (other than stone) of the common bile duct. Here progressive jaundice is the rule. In neither condition would one expect the gall bladder to fill with dye. It is impossible for me to explain to my satisfaction both adequate filling and enlargement of the gall bladder. They seem almost paradoxical. I hesitate to suggest that the films were wrongly interpreted, yet with due respect to our roentgenologists the fact remains that such unhappy circumstances can occasionally occur. A year or so ago on this same rostrum I attempted to account for an abdominal tumor reported by the roentgenologist, only to learn from Dr. Mallory that no tumor was found at autopsy. Perhaps Dr. Hampton can help us out with these films.

Dr. Aubrey O. Hampton: Apparently the radiologist was interested in the duodenum, because he took an enormous number of films. I must say that in most of them the duodenum does not look very normal. There is not much doubt that the mucosa of the duodenum is thickened, but when it is filled completely it is smooth in outline. Here is one spot film that shows a little fleck of barium in the cap that might be something abnormal. This is the gall bladder. It is large and stays that way in all the films, and this shadow within it shifts in position, but remains in the gall-bladder shadow. I think that there is evidence of gall-bladder disease, with a stone, and that for some reason or other the gall bladder is dilated. I also happen to know the diagnosis in this case and cannot answer too many questions, but the radiologist asked for a re-examination of the duodenum because he was not satisfied.

Dr. Adams: After viewing the films I must concede that the gall bladder is both well filled and large, but I do not know why. Nor can I account for the abnormality of the duodenum; the picture is not that of the secondary changes resulting from gall-bladder disease. One must therefore either disregard the gall-bladder enlargement and make a diagnosis of simple chronic cholecystitis with stone or, if one insists on accounting for the gall-bladder enlargement, conclude that something may be partially obstructing the cystic duct. Perhaps that something is related to the duodenum. At any rate I believe that the roentgenologic findings in the duodenum cannot be thrown aside. The evidence is far from clear cut, but tumor may be found.

Dr. William B. Breed: May I ask Dr. Hampton about the Graham test when there is a stone obstructing the cystic duct?

Dr. Hampton: There should be no increase in density because, of course, no dye enters the gall bladder. It is true, though, that a dilated gall bladder due to cystic-duct obstruction is sometimes visible on a plain film. I should think it would not be so dense as this one. I think that this gall bladder had dye in it, and that the cystic duct was open.

Dr. Adams: Needless to say, the diagnosis of simple gall-bladder disease is one that I am trying to escape. I am not willing to stand on that alone. The enlargement of the gall bladder still worries me, and so does the roentgenologist's report concerning the duodenum. I am therefore going to add carcinoma of the duodenum to the diagnosis of chronic cholecystitis with stone. The former is rare, I know, but this clinical picture is also rare.

Dr. Henry W. Faxon: Would you consider pancreatitis? He had stones, a high white-cell count and a great deal of nausea and vomiting.

Dr. Adams: My impression is that pancreatitis is usually secondary to a stone lodged in the ampulla of Vater. There is no evidence of common-duct stone in this patient, so that, in my opinion, pancreatitis is automatically excluded.

Dr. Hampton: Would you agree if the radiologist said that the patient had a duodenal ulcer?

Dr. Adams: Without a more clear-cut history, I should agree only if the roentgenologist could demonstrate a crater.

Dr. Tracy B. Mallory: Dr. Smith, you speculated a great deal about this case. Will you express an opinion?

Dr. William D. Smith: I did not believe that this patient could have a duodenal ulcer because I have never known anyone who grew up with fewer dyspeptic symptoms than this man had — practically none. As Dr. Adams said, the patient never had any severe pain, just a mild discomfort never sufficient to keep him awake. One night he woke up feeling a bit uncomfortable, and took a couple of drinks of whisky and went back to sleep.

Dr. Richard H. Sweet: I was privileged to see this patient with Dr. Walter Bauer before operation, and to operate on him. We talked the history over very carefully. We took the x-ray films

down and went over them with Dr. Richard Schatzki, who took them. He was puzzled by the duodenal findings but made no diagnosis, and when we asked whether or not there was an ulcer he said he did not know. He suggested another x-ray film. Dr. Bauer and I concluded that since the patient had had several x-ray examinations, there was no point in further repetition.

I operated, expecting to find gallstones, which perhaps were causing the type of gastric symptoms that gallstones cause at times, although in this case they were a little severer than usual.

DR. ADAMS: Dr. Smith, what did you make of the large gall bladder?

DR. SMITH: I did not know. If it was a stone in a big gall bladder I wondered why it did not empty. I asked Dr. Hampton if it could be due to obstruction of the cystic duct, and he said that he thought it could not be.

DR. MALLORY: Dr. Sweet, will you describe the operative findings?

DR. SWEET: Our preoperative diagnosis was correct, but only partly so, as Dr. Adams intimated. We were very much astonished to discover that the undiagnosed aspect of the case was an acute, almost completely perforated, duodenal ulcer. It was covered with a sizable plaque of fibrin, which was the only thing that kept the contents of the stomach and duodenum from entering the peritoneal cavity. I should have guessed that if we had palpated the patient rather vigorously ahead of time, or if it had gone a few more hours, this ulcer would have perforated. He had a gallstone and a large gall bladder. We therefore opened the gall bladder, removed the stone, closed the bladder and directed our attention to the perforating ulcer.

DR. ADAMS: Was it posterior?

DR. SWEET: No, it was anterior. Dr. Bauer, Dr. Mallory and I discussed the situation and finally decided to perform a resection, which went very smoothly.

CLINICAL DIAGNOSES

Cholelithiasis.
Chronic cholecystitis.

DR. ADAMS'S DIAGNOSES

Cholelithiasis.
Chronic cholecystitis.
Carcinoma of duodenum?

ANATOMICAL DIAGNOSES

Acute perforating duodenal ulcer.
Cholelithiasis.

PATHOLOGICAL DISCUSSION

DR. MALLORY: One must examine the microscopic slide to convince oneself how near to perforation this ulcer was. There is a deep funnel-shaped defect in the wall of the duodenum, passing down through the mucosa, submucosa, muscularis, and even the serosa. At its base there is a layer of fibrin 1.5 mm. in thickness, and even with minute examination not a fibroblast is to be found. If another gastrointestinal series had been done and the duodenum vigorously palpated once more, acute perforation would almost certainly have resulted. A case of this type is perhaps hardly a fair one to put up for differential diagnosis. The important decision was whether and when to operate, and fortunately, it was correctly made.

DR. HAMPTON: I think that the reason the diagnosis was missed was that in the so-called "compression films" there was no compression. The crater would have shown up plainly if it had been compressed. Perhaps there was too much tenderness.

DR. ADAMS: Is Dr. Hampton able to explain the large gall bladder?

DR. HAMPTON: We have seen similar ones from time to time without stone or anything else to account for them.

CASE 27052

PRESENTATION OF CASE

A thirty-one-year-old housewife was admitted to the hospital complaining of pain in the right shoulder and cough.

For about four or five years before entry the patient had intermittent attacks of nagging pain in the right shoulder. At times she was unable to lie on her right side because of a sense of oppression. There was dyspnea with moderate exertion, and a slight degree of orthopnea. During the nine-month period preceding her entry there was a gradual loss of 25 pounds in weight. For three months there was a mild cough, which was worse in the morning shortly after arising and was productive of a small amount of yellowish-white sputum. Two months before entry "electric treatment" was administered to her shoulder by an "Indian doctor." Subsequently she felt very much improved, and the pain in the shoulder and dyspnea disappeared. The weight loss continued, however, and she developed a heavy sensation in the right dorsal region. She entered another hospital, where x-ray examination showed a tumor in the right chest. A right thoracentesis produced thick yellowish fluid.

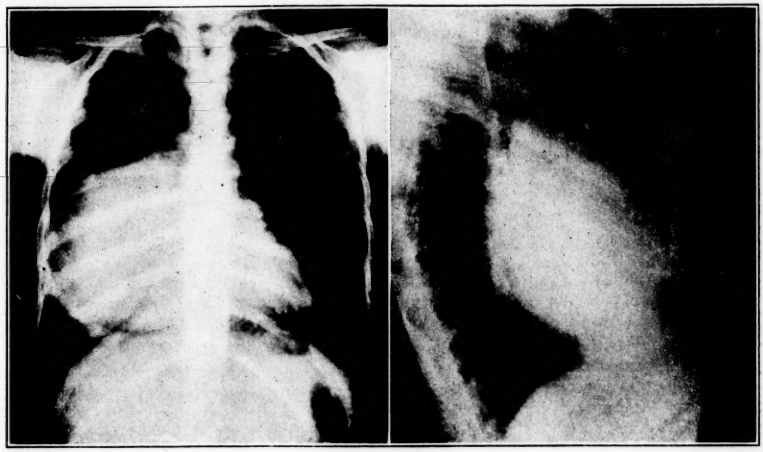
The past history was noncontributory.

Physical examination showed a rather pale, thin young woman in no acute discomfort. The neck veins were distended. The left border of the heart extended 1 cm. beyond the left midclavicular line. The sounds were regular, and there were no murmurs. The blood pressure was 120 systolic, 80 diastolic. From the midaxillary line on the right to the midsternal line and extending from the third rib downward there were dullness to flatness and diminished voice sounds. Tactile fremitus was increased. No rales were heard. The remainder of the examination was negative.

The temperature, pulse and respirations were normal.

Examination of the urine was negative. The blood showed a red-cell count of 4,900,000 with a hemoglobin of 75 per cent, and a white-cell count of 6600 with 74 per cent polymorphonuclears. A blood Hinton test was negative.

X-ray films of the chest showed a large ovoid mass adjacent to the right border of the heart and filling the greater portion of the right lower-lung and midlung fields (Fig. 1). In the lateral view the mass filled the anterior two thirds of the chest. The lower border of the mass touched the diaphragm, and its upper border extended above the level of the hilus. Its center lay slightly anterior to the trachea in the lateral view. There were several plaques of calcification within its periphery. The heart was not displaced, and the mass could not be separated from the right cardiac border. Slight transmitted pulsation was evident. The right border of the heart was visible neither during fluoroscopy nor on the film. The superior mediastinum was distinctly widened, and its border was concave laterally. The remainder of the chest was not remarkable.



A B

FIGURE 1. *Photographs of X-Ray Films Showing the Ovoid Mass in the Chest.*
A = *anteroposterior view;* B = *lateral view.*

On the seventh hospital day an exploratory thoracotomy was performed.

DIFFERENTIAL DIAGNOSIS

DR. RALPH ADAMS: Chronic pain in the shoulder in association with symptoms of visceral disease may itself be considered visceral in origin when local explanations are lacking. Visceral causes may be grouped as those that irritate the diaphragm or its serous coverings, either peritoneal and pleural, those involving the upper intercostal nerves, and those directly affecting the phrenic nerve.

A sense of oppression on lying down is common in diseases characterized by abnormal return flow of blood to the heart, such as right-sided failure with pulmonary congestion and constrictive peri-

carditis with increased venous pressure. Cerebral anoxemia from venous stasis is a common factor in these conditions, and the patient learns to stay comfortable by avoiding the horizontal position. A sense of oppression arising unilaterally, however, suggests a localized partial obstruction to blood flow and demands a more specific explanation.

The loss of 25 pounds in weight within a year is indicative of altered metabolism. Either the patient had stopped eating or there had appeared some catabolic factor such as cancer, tuberculous infection or thyrotoxicosis to account for the weight loss. Any one of the three might bring about a productive morning cough, the first by invasion of the bronchial mucosa or pressure on a bronchus, the second by parenchymal lung destruction and the third by pressure on the trachea or a main bronchus, if the goiter lay substernally.

A heavy sensation in one side of the chest, if persistent, is only rarely imaginary, although adequate explanation frequently eludes careful investigation, and the passage of time may be required for the development of localizing signs. In this case the heaviness in the chest appeared late and was apparently due to an expanding lesion. Pleural effusion, tumors causing bronchial constriction and pneumothorax may produce the symptom of heaviness, and probably have been named in the order of frequency, although statistical proof is not at hand.

The physical examination was unquestionably colored by the report from the outside hospital of a tumor in the right chest and the presence of thick yellowish intrapleural fluid. Distention of the neck veins means increased pressure within the superior vena cava. A normal heart by examination, so far as data are given for interpretation, excludes pericardial and cardiac disease and leaves one free to follow the assumption that the superior caval compression was due to the tumor mass. Signs of dullness over areas normally occupied by aerated tissue indicate replacement of the latter by tissue of greater density and less air content than the normal lung. These are signs that might be found over lung infiltrated by tumor and devoid of air, over a mediastinal tumor displacing and compressing the lung or over an encapsulated empyema. The absence of rales is not conclusive, but strongly suggests that the lung is not intrinsically diseased. Intrapulmonary disease sufficient to produce the other signs recorded could scarcely exist without producing rales.

The x-ray films described afford additional valuable evidence, and support the impression obtained from the history and the physical examination that the lesion is outside the lung and in the mediastinum — in fact, in the anterior mediastinum.

Its position is medial to that which an empyema could occupy without rupture into the mediastinum, and the absence of evidence of infection further excludes that unlikely possibility.

To recapitulate, a typical history is given of a slowly growing anterior mediastinal tumor, producing a progressive sequence of symptoms — namely, displacement of the phrenic nerve posteriorly, with symptoms referred to the shoulder, interference with venous return from above the heart, presumably from pressure, a sense of oppression when the pressure was aggravated by lying on the affected side, distention of the neck veins and a mild productive cough by pressure irritation of the lower trachea.

There remain only three diagnostic possibilities. One is substernal goiter. The low position in the chest does not exclude it, and there is at least one surgical specimen in the hospital material of a large goiter removed from its resting place on the diaphragm. The weight loss is consistent with goiter, but there is no history of hyperthyroidism and the pulse is normal. A nontoxic or colloid goiter of this size in the mediastinum without detectable signs in the neck or elevated basal metabolic rate is possible. The calcification noted could occur in thyroid tissue, but an exudate of thick yellowish fluid ought not to be present.

Another possible diagnosis is neurofibroma, a notorious stimulator of diagnostic guessing bees, but it rarely occurs in the anterior mediastinum, being usually found in the posterior region, lying in the costovertebral gutter, arising from intercostal or sympathetic nerves and sometimes eroding contiguous ribs by pressure.

Malignant tumors are not among the probabilities in this case because of the duration of symptoms, the relative health of the patient and the calcification within the slowly growing tumor walls. Teratoma is also excluded.

The final and only tenable diagnosis is dermoid cyst of the anterior mediastinum. In the absence of signs of effusion in the x-ray film, it seems likely that the thoracentesis was in effect a puncture of the cyst and that the turbid fluid obtained represented cyst contents. I should like to have had the opportunity to examine this fluid for the presence of cholesterin crystals and epithelial debris; if present, they would have confirmed my diagnosis.

Clinical Diagnosis

Dermoid cyst of anterior mediastinum.

Dr. Adams's Diagnosis

Dermoid cyst of anterior mediastinum.

Anatomic Diagnosis

Dermoid cyst of anterior mediastinum.

Pathological Discussion

Dr. Tracy B. Mallory: The X-ray Department was reluctant to make a diagnosis of a dermoid cyst in this case because of the presence of calcification. We have, however, seen calcification in dermoids on other occasions. Dr. Adams's diagnosis was readily substantiated when the patient was operated on by Dr. Edward D. Churchill. The right pleural cavity was opened following subperiosteal resection of the fourth right rib. A large avascular cystic tumor was found in the anterior mediastinum projecting into and largely filling the right pleural cavity, displacing the middle and lower lobes backward and laterally. The upper lobe was partially adherent. A plane of cleavage was found that permitted fairly easy enucleation except at the point of origin, which was just below the point of bifurcation of the trachea and about the superior vena cava.

The specimen that reached the laboratory was an unruptured cyst 20 cm. in circumference, with a wall varying from 2 to 4 mm. in thickness, which contained numerous thin calcified plaques 2 to 6 mm. in diameter. The cavity contained matted hair, and on microscopic examination the walls showed the characteristic skinlike structure of a dermoid.

The patient made a rapid postoperative recovery from the physical point of view, although the development of a postoperative psychosis somewhat delayed her discharge from the hospital.

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COMMUNITY FUND

Last week physicians were reminded that a challenge had been issued, since their quota for the Community Fund had been increased to $20,500.

How is it going? At the end of the first week of the drive, January 24, a total of seventy-three doctors had given $7000, which is an average of nearly $100 per person. Twenty-four of this number made increases in their gifts over last year. These men are the leaders, and they also give generously of their time in many of the social agencies that the fund helps to support.

An interesting anecdote is worth recording here. One of these men said: "Well, here is the yearly collection of pledges for the fund. You know, I think we should look on this organization as a voluntary tax program in which we give to a selected group whom we trust, to manage our community welfare." This expression contains the very essence of the objective in contributing to the Community Fund.

The community is looking for the financial support of the medical profession, and only five days remain.

SOCIAL HYGIENE DAY

The designation of February 5 as Social Hygiene Day is particularly significant this year, since large numbers of young men will be gathered together in cantonments and in the areas where war industries are located. It is a well-recognized fact that when young men are collected in camps or in industrial centers, syphilis and gonorrhea constitute a major hazard. During World War I a total of 7,004,818 days, equivalent to a year's actual absence from service of 22,300 men, was lost by the United States Army and Navy as the result of genitoinfectious diseases.

Although the Government plans to protect the health of its soldiers and sailors so far as possible, it cannot regulate their behavior when off duty. The health of workers in the war industries is even less controlled, and that of the civil population, so far as it is affected by contact with service men and workers, is regulated only when the identity of an infected person is made known to the local board of health.

During this critical period, the American Social Hygiene Association and its constituent state societies can be of the greatest help. A four-point program has been outlined, consisting of the following activities:

Through educational activities, such as films, literature, exhibits and lectures, to help soldiers, sailors, industrial workers and the population in general to understand the hazards of syphilis and gonorrhea.

To encourage the passage and enforcement of protective laws for the reduction of prostitution and the prevention of delinquency, especially in areas of concentration of armed forces and of defense-industry workers.

To promote and aid in the establishment of facilities for early disinfection and other preventive measures.

To urge provision of adequate diagnosis, treatment and isolation, particularly where local facilities are inadequate to cope with the situation.

This program is an amplification of the work that has been carried on for some years by the Massachusetts Society for Social Hygiene and its adaptation to the particular needs arising from the concentration of young men in camps and industrial centers.

The situation is one that deeply affects the whole nation; it calls for co-ordinated action by all those organizations that are concerned with the public welfare. It is imperative that the members of the medical profession should be prepared to inform the public of the deleterious effect of genitoinfectious diseases on the efficiency of the nation's forces, and to spread the doctrine that control of these diseases is an important way to strengthen national defense.

MEDICAL EPONYM

Gaucher's Disease

"L'épithélioma primitif de la rate, hypertrophie idiopathique de la rate sans leucémie [Primary epithelioma of the spleen, idiopathic hypertrophy of the spleen without leukemia]" was the title of Philippe Charles Ernest Gaucher's (1854–1918) thesis for the degree of doctor of medicine from the University of Paris in 1882. The following translation is the résumé of his conclusions:

> There is a peculiar kind of primary and idiopathic hypertrophy of the spleen to which I propose to give the name *"primary epithelioma of the spleen"* in accordance with its histologic characteristics.
>
> The *clinical features* of this disease are: gradual, progressive enlargement of the spleen to a considerable degree, with associated spontaneous pains and various compression phenomena, hemorrhage (epistaxis, purpura and hemorrhagic gingivitis), occasionally jaundice resultant on secondary enlargement of the liver, without leukemia, intermittent fever or ascites, and terminating in a marked cachexia.
>
> The *anatomic feature* is a very large spleen (4770 gm.) of uniform and even development, its surface smooth and regular, the color and form almost normal, but hard and sclerotic.
>
> The *histologic characteristics* are: complete replacement of the normal splenic elements by large, epithelial cells, irregularly rounded or polyhedral in shape, nucleated, and enclosed in the normal interstices of the hyperplastic splenic reticulum; interstitial hemorrhages; complete disappearance of the Malpighian corpuscles; partial disappearance of the blood vessels.

R. W. B.

MASSACHUSETTS MEDICAL SOCIETY

SECTION OF OBSTETRICS AND GYNECOLOGY*

Raymond S. Titus, M.D., *Secretary*
330 Dartmouth Street
Boston

Congestive Failure Due to Mitral Stenosis and Treated by Therapeutic Abortion

Mrs. R. E., a thirty-nine-year-old para IV, was admitted to the hospital on June 21, 1940, complaining of shortness of breath and epigastric fullness. She was in the sixth month of her pregnancy.

The family history was noncontributory. The patient's past history included measles and typhoid fever, for which she was kept in bed five or six weeks. There was no history of rheumatic fever or chorea. The first two pregnancies went to full term with normal deliveries. The third pregnancy, in 1936, was complicated by decompensation in the third month. After consultation, a therapeutic abortion was performed, following which the patient made a complete recovery. Catamenia began at the age of twelve, were regular with a thirty-day cycle and lasted five days without pain. The last period began on December 20, 1939, making the expected date of confinement, September 27.

The patient had been feeling fairly well since the onset of this pregnancy except for swelling of the feet and ankles and some breathlessness on exertion during the month preceding entry. On June 17, she began to have considerable dyspnea, coughing and a painful sensation across the lower chest and epigastrium. She was admitted to the hospital four days later.

In view of the cardiac condition, a medical consultation was held. The consultant's note reads as follows:

> The patient has had well-compensated valvular heart disease, but congestive failure has now developed. Physical examination shows tachycardia and slightly accentuated heart sounds, with definite diastolic and presystolic murmurs at the apex and a slight early diastolic murmur at the left sternal border; there are rales at bases of the lungs and definite pitting edema over the sacrum and ankles. The blood pressure is 180 systolic, 85 diastolic. Diagnoses: mitral stenosis, hypertension and congestive failure. Immediate digitalization is advised, and if after a few days, the patient shows some improvement, a therapeutic abortion should be performed.

*A series of selected case histories by members of the section will be published weekly. Comments and questions by subscribers are solicited and will be discussed by members of the section.

On July 1, under cyclopropane anesthesia, a therapeutic abortion was completed by means of abdominal hysterotomy. A living premature baby was delivered, who died forty hours later. Both tubes were ligated at the time of operation. Convalescence was essentially afebrile, and the patient was discharged on the thirteenth postoperative day.

The patient's general condition at discharge was good. There was no edema; the blood pressure was 118 systolic, 74 diastolic, the pulse 88. There was no dyspnea or signs of cardiac embarrassment.

Comment. The question arises whether the present pregnancy should have been terminated, like the previous one, by early therapeutic abortion. That this would have been the wiser procedure is shown by the decompensation that subsequently developed. However, the advisability of interrupting pregnancy in a cardiac patient who has been allowed to go on to such a late stage is questionable. Some authorities advise hospitalization and carrying the patient to term. However, in spite of rules and in spite of statistics, each case should be decided on its own merits. The result in this case reasonably justified the treatment.

MEDICAL POSTGRADUATE EXTENSION COURSES

The following sessions, given by the Massachusetts Medical Society in co-operation with the Massachusetts Department of Public Health, the United States Public Health Service and the Federal Children's Bureau, have been arranged for the week beginning February 2:

MIDDLESEX EAST

Tuesday, February 4, at 4:15 p.m., at the Melrose Hospital, Melrose. Diagnosis and Treatment of Minor Lesions of Rectum and Anus. Instructor: Neil W. Swinton. Walter H. Flanders, *Chairman.*

MIDDLESEX SOUTH

Tuesday, February 4, at 4:00 p.m., at the Cambridge Hospital, Mt. Auburn Street, Cambridge. Obstetric Complications: With case histories and clinical problems. Instructor: M. V. Kappius. Dudley Merrill, *Chairman.*

NORFOLK

Thursday, February 6, at 8:30 p.m., at the Norwood Hospital, Norwood. Acute Abdominal Pain: Its interpretation and management. Instructor: Richard B. Cattell. Hugo B. C. Riemer, *Chairman.*

NORFOLK SOUTH

Monday, February 3, at 8:30 p.m., at the Quincy City Hospital, Quincy. Dermatitis and Eczema. Instructor: Jacob H. Swartz. David L. Belding, *Chairman.*

SUFFOLK

Thursday, February 6, at 4:30 p.m., in John Ware Hall, Boston Medical Library. Dermatitis and Eczema. Instructor: John G. Downing. Reginald Fitz, *Chairman.*

DEATHS

CROFTS — NICHOLAS M. CROFTS, M.D., of North Adams, died September 17, 1940. He was in his seventy-sixth year.

Born at Carlton Place, Canada, he received his degree from the Baltimore Medical College in 1898, and in 1914 took a postgraduate course at the University of Maryland.

Dr. Crofts was a fellow of the Massachusetts Medical Society and of the American Medical Association.

A daughter and one brother survive him.

MAGEE — EDWARD J. MAGEE, M.D., of Danvers, died January 20. He was in his seventy-ninth year.

Born in Oswego, New York, he attended Ottawa College and Villanova College and received his degree from the College of Physicians and Surgeons of Boston in 1891.

Dr. Magee was a member of the Massachusetts Medical Society and the American Medical Association, and was on the staff of the Hunt Memorial Hospital in Danvers.

A daughter survives him.

MISCELLANY

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR DECEMBER, 1940

DISEASES	DECEMBER 1940	DECEMBER 1939	FIVE-YEAR AVERAGE*
Anterior poliomyelitis	0	6	6
Chicken pox	1679	1511	1442
Diphtheria	9	20	26
Dog bite	589	578	539
Dysentery, bacillary	3	27	12
German measles	48	26	62
Gonorrhea	294	335	470
Lobar pneumonia	406	396	469
Measles	1166	1082	964
Meningococcus meningitis	7	1	6
Mumps	597	347	603
Paratyphoid B fever	1	2	3
Scarlet fever	642	412	722
Syphilis	376	433	454
Tuberculosis, pulmonary	326	284	259
Tuberculosis, other forms	30	28	28
Typhoid fever	6	5	7
Undulant fever	5	2	5
Whooping cough	1160	498	809

*Based on figures for preceding five years.

RARE DISEASES

Anthrax was reported from: Haverhill, 1; Peabody, 1; total, 2.

Diphtheria was reported from: Boston, 1; Chelsea, 1; Fall River, 5; Reading, 1; Waltham, 1; total, 9.

Dysentery, bacillary, was reported from: Boston, 2; Watertown, 1; total, 3.

Meningococcus meningitis was reported from: Beverly, 1; Boston, 1; Milford, 1; Orange, 1; Swampscott, 1; Worcester, 2; total, 7.

Paratyphoid B fever was reported from: Springfield, 1; total, 1.

Pfeiffer bacillus meningitis was reported from: Orange, 1; Spencer, 1; total, 2.

Septic sore throat was reported from: Boston, 5; Malden, 2; Medford, 1; Melrose, 1; Merrimac, 1; Montague, 1; New Bedford, 1; Quincy, 1; Taunton, 2; Wrentham, 2; total, 17.

Trachoma was reported from: Boston, 1; New Bedford, 1; total, 2.

Trichinosis was reported from: Boston, 1; total, 1.

Typhoid fever was reported from: Boston, 1; Lawrence, 1; Lexington, 1; New Bedford, 1; Quincy, 1; Waltham, 1; total, 6.

Undulant fever was reported from: Acton, 1; Amherst, 1; Chelmsford, 1; Lynnfield, 1; Petersham, 1; total, 5.

Chicken pox, measles and pulmonary tuberculosis were reported above the five-year averages.

Diphtheria, typhoid fever, paratyphoid fever, anterior poliomyelitis, bacillary dysentery, German measles, lobar pneumonia and scarlet fever were reported below the five-year averages.

The incidences of meningococcus meningitis, mumps, tuberculosis (other forms) and undulant fever were not remarkable.

Whooping cough showed unusually high incidence.

Dog bite was reported at a record high figure for the fifth consecutive month. Animal rabies was reported from Leicester, Spencer and Worcester, which are adjacent to one another.

TUBERCULOSIS EXHIBIT

Last year the National Tuberculosis Association built for the annual meeting of the American Medical Association an illuminated exhibit on "Morphologic Biology of Tuberculosis." A new and better exhibit is being built for the Cleveland meeting. It may be borrowed by any medical society whose meeting is to be held later than June 10, 1941. Those who are interested should communicate with the Massachusetts Tuberculosis League, Little Building, Boston.

MAINE NEWS

Panel Discussions Available to County Medical Societies

The following panel discussions have been made available for presentation before county medical societies by the Committee on Graduate Education:

Coronary Disease. E. H. Drake, M.D., Portland, chairman.

Complications of Pregnancy. R. B. Moore, M.D., Portland, chairman.

Disease of the Liver and Bile Passages. J. Gottlieb, M.D., Lewiston, chairman.

Endocrine Dysfunction. James Carswell, M.D., Camden, chairman.

Syphilis. O. R. Johnson, M.D., Portland, chairman.

Chemotherapy. F. T. Hill, M.D., Waterville, chairman.

Appendicitis. I. M. Webber, M.D., Portland, chairman.

New Members

The following physicians have recently been admitted to membership in the Maine Medical Association:

James M. Parker, Portland.
Henry B. Finks, Portland.
Dexter J. Clough, 2nd, Bangor.
Hans Schurman, Dexter.
John E. Smith, Bangor.

MOTOR-VEHICLE DEATHS FOR 1940

Motor-vehicle deaths in one hundred and fifty-eight major cities increased 3.4 per cent in 1940 over the previous year, according to reports made public recently by Director William L. Austin, Bureau of the Census, Department of Commerce. Deaths for 1940 totaled 8441, compared with 8162 in 1939. These percentage increases are based on provisional figures for 1940 and 1939.

Considering only those deaths in each city due to motor-vehicle accidents occurring within the city limits, the 1940 reports showed a total of 5799 deaths. This figure is an increase of 68 deaths, or 1.2 per cent, over the 5371 deaths reported for the same cities in 1939. The increase in the total is reflected in the individual cities, seventy-six of which showed an increase in the number of deaths over 1939; seventy-one showed a decrease, and eleven cities had the same number.

Eight of the cities having populations of 500,000 or more and showing increases in the number of deaths occurring within the city are: New York City (1.0 per cent); Detroit (13.5 per cent); Los Angeles (12.0 per cent); Baltimore (2.4 per cent); St. Louis (91.5 per cent); Boston (7.1 per cent); Pittsburgh (11.6 per cent); and Milwaukee (25.0 per cent). Five cities having similar populations and showing decreases from the 1939 figures are: Chicago (4.4 per cent); Cincinnati (13.0 per cent); Washington (24.4 per cent); San Francisco (13.2 per cent); and Buffalo (22.9 per cent).

CORRESPONDENCE

PHYSICIAN WANTED AT ST. GEORGE, MAINE

To the Editor: The town of St. George is without a physician. Do you know some good physician who would be interested in locating here? The nearest physician we can call lives in Thomaston or Rockland, fifteen or twenty miles away.

M. J. Harris.

Tenants Harbor, Maine.

ENGLAND IN THE FALL OF 1940

To the Editor: I believe the following letter from Sir James Purves-Stewart will be of interest to the readers of the *Journal*. It is written from his lighthouse home on the south coast of Sussex, a most exposed position.

Henry R. Viets, M.D.

* * *

Belle Toute Lighthouse,
Beachy Head, Sussex,
November 4, 1940.

Dear Dr. Viets:

Your very kind letter of August 31 took many weeks to arrive, but ultimately reached me here a couple of weeks ago. I waited until today, when the reprint of your kindly review of "Sands of Time" arrived, before replying to it. I am glad that the book made a favorable impression on you.

We in England are at the most historic phase of our history. During the last six months, we have had to confront one catastrophe after another. In May the allied forces, which had occupied Narvik in Norway, were withdrawn, to face-up Hitler's sudden "protection" of Denmark and his unprovoked attack on Holland and Belgium. Then the Germans out-flanked the Maginot line, on which the faith of the French had been blindly fixed,

and proceeded to sweep into Belgium from the south as well as the west. Holland threw up the sponge, after four days. Then in Flanders, after a courageous allied Franco–Anglo–Belgian start, Leopold of the Belgians suddenly surrendered, without notifying his allies, thereby laying the left flank of the allied army wide open to the enemy. The Germans naturally thought they had us at their mercy, surrounded on three sides. But the English, and part of the French army, fought their way back to the coast at Dunkirk, where nine tenths of their army of 350,000 men were successfully evacuated by the British fleet, assisted by every available smack, fishing-boat and pleasure-boat on the east coast of England. All this was under a withering hail of artillery and tank guns, likewise air-plane bombs, from the enemy. The English troops made a stubborn resistance. Our air-planes drove off the Germans with comparative ease, whenever they got in touch; our infantry cut through the German battalions like straw, being better than them, man-for-man, every time. Our troops hated re-embarking, but the strategic position was hopeless and we were out-numbered six or seven times over. Anyhow the withdrawal, skilful though it was, was a major set-back for us, and one which we are grimly determined to avenge, when the time comes.

Then, worst of all, France, betrayed by her corrupt government, threw up the sponge, and left Great Britain to carry on alone. Ever since, the puny politicians at Vichy have been grovelling to the German high command. Petain has become a confirmed boot-licker of his conqueror. His speeches, to his own countrymen, have been ignoble in their servility, entirely unlike what one would have expected from the hero of Verdun in 1917.

England is now the only European power that stands between Hitler and world domination. We are determined to fight, to the last man, the last cartridge, and the last ration. But since we have been alone, the tide has begun to turn. Every month we feel more optimistic. One side or the other must be crushed, and crushed permanently. It won't be England. We are full of enthusiasm and keenness. Hitler's threat of invasion, and the partial attempt which he started to make in September, has not materialised. We hoped it would. Every man here was and still is, on tip-toe, eager to get at the enemy and to ensure that not one of the invaders will ever see his Vaterland again.

I myself joined-up with the Home Guard, doing rifle-practice, bombing-tactics, etc., and wearing khaki uniform (for the third time in my lifetime). Of course I was over-age, but I managed to have a failure of memory when stating my age, and was not only accepted but placed in charge of the medical arrangements for casualties in our local battalion. Since then after three months service, under false pretences, I have been combed out. Had I been placed in the dock as a criminal, I should have pleaded guilty, and thrown myself on the mercy of the court.

Recently I have been appointed as liaison-officer with the Foreign Relations Department of the British Red Cross, and last week completed a tour of inspection of prisoners-of-war camps in England. Most of these prisoners are young airmen. It is interesting to observe their mentality. They are officers, but not "officers and gentlemen." They are more like the gangster type. And they have abnormal tastes, at times. The amount of face-cream bought by German airmen-officers is curiously large. If lip-stick were available, they would buy that, too. Several have been brought down with painted lips and cheeks. This German type of vice is interesting to the medical psychologist.

By this time our airmen have clearly demonstrated their superiority over the Germans. The enemy losses in air-fights are three or four to one of ours. So we have command of the air over England, although the Germans send over air-planes at night, to destroy London, Liverpool, Eastbourne, Dover and other towns. They claim that they only attack "military targets." These include St. Paul's cathedral, St. James's, and Buckingham and Kensington palaces, the mediaeval Elizabethan Temple of the law-courts, and innumerable hospitals and rows of private houses. The German embassy in London, by accident, has been destroyed by their own bombs. But every man, woman and child is a military target to the German airman. We recognise this, and don't grumble unnecessarily.

Meanwhile our navy commands the seven seas. And when our growing supply of air-planes, from Canada and the U. S. A., attains anything like equality in numbers with the enemy, we shall then disinfect the skies of Europe from the Nazi stench.

You should envy us in England. Don't be sorry for us. As Shakespeare says in *Henry V*:

> If we are mark'd to die, we are enow
> To do our country loss; and if to live,
> The fewer men, the greater share of honour. . . .

Here in our little lighthouse, on the Sussex cliff-edge, we are daily witnesses of bombings and aerial dog-fights. So far, our lighthouse has not been hit, although many bombs have fallen close by. We have sand-bagged our roof against incendiary bombs. The main tower, of granite, six-feet thick, will probably stand up to a direct hit, even from a heavy shell. But we are determined to "stay put." If we are to be bombed, we shall be bombed comfortably in our own home, rather than wandering over the country, seeking for some unattainable safe place.

If only your poly-ethnic U. S. A. would come in, too, it would hasten the victory — even if not a single American soldier embarked for Europe.

With kind regards to yourself and all my American friends and colleagues.

Very cordially yours,
J. Purves-Stewart.

The German radio informs us that we are already completely beaten, and it is only our congenital stupidity which prevents us from realising it.

MASSACHUSETTS STATE GUARD

A number of doctors are needed for duty as medical officers with the new Massachusetts State Guard which is now being formed. This volunteer organization will function in place of the Massachusetts National Guard, which is being inducted into federal service. It will be trained to cope with any emergency situation that might occur within the Commonwealth and which might overtax the capacities of civilian organizations.

A doctor, after receiving his commission, at the outset will have to devote a certain number of evenings to the examination of recruits, and thereafter will be expected to give one evening a week to drill, training and other routine duties. Full-time service will be required only in the event of some emergency, and will be limited to within the State.

The requirements of the physical examination are not strict. Previous military experience is desirable but not a necessary prerequisite. It is not expected that this duty

will interfere materially with one's private practice. Any interested medical men will please communicate promptly with the undersigned, stating briefly their age, qualifications, and previous military experience, if any. Outside the Greater Boston area, there is need for one or more men in or near Brockton, Fall River, Framingham, Holyoke, Lawrence, Lynn, New Bedford, Pittsfield, Plymouth, Salem, Springfield and Worcester.

. RICHARD H. MILLER, M.D., *Chief Surgeon.*

264 Beacon Street,
Boston.

REPORT OF MEETING

NEW ENGLAND PEDIATRIC SOCIETY

A regular meeting of the New England Pediatric Society was held at the Longwood Towers on October 30, 1940, with Dr. R. Cannon Eley presiding. Dr. Philip M. Stimson, of the Willard Parker Hospital in New York City, spoke on "Certain Aspects of the Common Contagious Diseases." Only the more important practical and controversial problems concerned with measles, mumps, chicken pox, rubella, scarlet fever, diphtheria, pertussis and poliomyelitis were discussed.

With regard to prevention, Dr. Stimson stated that active vaccination is definitely indicated for diphtheria and strongly advised for pertussis, particularly in infancy. An analysis of statistics from Cleveland, where 10 per cent of the children received Sauer vaccine, and neighboring Shaker Heights, where 75 per cent were vaccinated, revealed that the incidence of pertussis declined 11 per cent in the former and 83 per cent in the latter community, as compared with the prevaccination era. And there also seems to be evidence that the severity of the disease is diminished, even if total protection is not afforded. The total dose may now be as high as 100,000,000,000 organisms, and the question of a "refresher" vaccination each year during childhood is being considered.

Dr. Stimson considers scarlet fever vaccination to be effectual but not necessary or feasible except in asylums, in families in which scarlet fever has appeared, and in the medical and nursing professions.

An interesting situation has now arisen as the result of the widespread adoption of diphtheria vaccination; young adults are less exposed to the disappearing disease, and there is an increase in the percentage of susceptibles as shown by statistics. It was advised, therefore, that nonimmune young adults receive two doses of alum-precipitated toxoid, with an interval of one month between injections. The Schick relapse rate, interestingly enough, has been found to be three times as high in those with the disease as in the vaccinated group.

Passive immunization is accepted for scarlet fever and diphtheria, whereas the use of convalescent serum in whooping cough is believed to confer at least a partial immunity for two or three weeks. This method of attack is particularly recommended for very young infants, who would fail to respond to active immunization.

So far as the virus infections are concerned, Dr. Stimson said that chemotherapy has so far proved inefficacious; that passive immunity with serum may be conferred when there is a generalized circulation of the causative agent, as in measles and mumps; that this form of prophylaxis is of no avail once the virus has become intracellular; that active immunity with dead or inactivated virus is ineffective; and that the immunity resulting from contracting the disease is lasting and of humoral and cellular form — except in herpes and influenza.

Further prophylactic possibilities are now being developed by the Dicks, who are working on a pill form of toxin for scarlet fever, and by experiments concerning the effect of chorioallantoic extracts on the virus of measles.

Diagnostic problems were next discussed. It has been found that measles usually occurs in biennial epidemics. Measles is not spread by its complications, so that a patient may be considered safe five days after the rash. The blood of measles patients is contagious, at least during the latter half of the incubation period, but Dr. Stimson stated that this does not mitigate against the pooling of such blood with others for "bank" purposes.

Rubella is rare except in epidemics and should be diagnosed with caution. Roseola infantum also is of importance in the differential diagnosis of measles. It occurs at two to three years of age and is ushered in by three days of unexplained fever with a morbilliform rash appearing after the fever has fallen and then starting on the body and being unaccompanied by Koplik's spots or coryza.

Chicken pox has been found to break out in epidemic form about two weeks following herpes zoster.

Diphtheria should probably be diagnosed clinically in most cases and should be corroborated by cultures. The use of a 2 per cent aqueous solution of potassium tellurite, which causes a blackening of the membrane, has been shown to result in too many false positive reactions to make it reliable, although a negative test rules out diphtheria fairly well. Clinically in diphtheria there is no erosion or ulceration but only a piling up of tissue. In the presence of ulceration, syphilis should be suspected if pain is absent; Vincent's angina, if the lesion is painful; and agranulocytic leukopenia, if prostration is marked. The electrocardiogram is useful in the diagnosis of late cardiac involvement. In mild cases there may be only an inverted T wave, but this should suffice to keep the patient in bed as long as two months. Eventual complete recovery is the rule unless death ensues.

Mumps occurred in one twentieth of the white and one sixth of the colored soldiers in the United States Army during World War I and was the third most important disease for loss of time. The virus probably enters by way of the nasopharynx into the bloodstream and then lodges in the glandular system, particularly the parotid glands. Meningitis and orchitis may occur at any stage, with or without parotitis. The height of the fever depends on the pressure to which the inflamed tissues are subjected. Sterility has been found a rare sequela because of the infrequent bilateral or complete involvement of the testes. Early incision of the testis was advised to lower the temperature, relieve the pain and prevent the danger of sterility.

In regard to treatment of these diseases, Dr. Stimson warned of the need for careful evaluation of statistics and clinical impressions, for the causative agent may vary in virulence and the course may be variable. The mortality from whooping cough at the Willard Parker Hospital, for example, decreased from 8 to 2 per cent on the same regimen. The importance of preventing cross and secondary infections was stressed, and the suggestion was made for less crowding in children's wards and better nursing technic. Isolation is usually based on the premise that there are no airborne epidemics and that a cough carries only five feet. Yet streptococci have been shown to exist in viable form in dust for twenty-four hours, and it is possible that several other organisms may do likewise. The use of ultraviolet light for air sterilization has been found to give encouraging results. The inoculation of all admissions to children's wards with convalescent or

adult serum or with placental extract has been suggested.

The prevention of the spread of chicken pox remains an enigma. For treatment daily baths without rubbing were advised, and the immediate removal of all plaster casts and adhesive tape was strongly urged.

Scarlet fever is of variable severity, as shown by statistics from different countries and localities. Human convalescent serum in doses of 40 to 100 cc. within twenty-four hours has been found beneficial, whereas modified horse serum, which gives reactions in less than 10 per cent of cases, has been shown to be equally effective and cheaper. Its use has been particularly advised for severe, toxic cases. Sulfanilamide, if administered early, may diminish the complications, for it guards against the streptococci of cross infections if not against those of scarlatina itself.

Convalescent serum decreases the number of cases and severity of measles if given more than twenty-four hours before the eruption. This is the only instance of effective serum therapy against a virus. The complicating pneumonias usually respond to chemotherapy, since they are streptococcal or mixed in etiology. Those of virus origin do not respond.

The pneumonia of pertussis should be treated as dictated by the culture, but the results with chemotherapy are not so good as in measles. To decrease the cerebral anoxia of the spasms and the resulting convulsions, oxygen has been found beneficial. The use of Kreuger vaccine for ten to fourteen days is expensive and hard on the patient in view of its questionable value in decreasing the severity of individual spasms.

In treating diphtheria, not less than 10,000 units of antitoxin are administered immediately intramuscularly; the use of more than 25,000 units intramuscularly and the same amount intravenously is rarely necessary. In toxic patients 5 to 10 per cent glucose is given intravenously to combat the decrease of liver glycogen. Laryngeal diphtheria is treated by aspiration rather than intubation. Serum reactions are being encountered in fewer cases. Histaminase is still unproved as an antidote, but Dr. Stimson stated that only very rarely is one unable to administer antitoxin following proper precautions. The use of a loose tourniquet and ephedrine was suggested, for patients thought to be serum sensitive, the injections being made in the anterior thigh, otherwise deep in a buttock.

More streptococcal throats are now being seen, and the early use of tracheotomy in cases of laryngeal obstruction instead of the former nonoperative regimen has resulted in the saving of 70 per cent of serious cases.

Investigations in poliomyelitis have accomplished little. A considerable incidence of the virus has been found in the stools, even of normal persons, a fact which presents the problem of whether the alimentary rather than respiratory tract is not the mode of entrance. The possibility that epidemics are started by food, water and other than human hosts is becoming more real. The best protection at present, therefore, probably lies in proper personal hygiene, the prevention of fatigue, pasteurization of all milk, the boiling of water, and the barring of public swimming and of the performance of tonsillectomies during an outbreak. Treatment should consist in complete rest in any illness during an epidemic. A patient should not be moved, even to a hospital, unless a respirator is necessary. After diagnosis no muscles should be allowed to be stretched and no serum need be given. Ten per cent glucose may aid toxic patients, and massive doses of thiamin chloride are possibly worth trying.

The discussion was opened by Dr. Conrad Wesselhoeft, who suggested the mixing of urban and rural recruits in training camps to decrease the incidence of measles and mumps, and the use of convalescent serum for nonimmune contacts. The orchitis of mumps rarely occurs before puberty. Early incision is reserved for severe cases to relieve pain, to lower the fever and to save the testis from pressure atrophy. Ovaritis may occur before puberty and is usually accompanied by a vaginal discharge, moderate pain and an elevated temperature. In adults the temperature may reach 106°F. and may be accompanied by chills. Atrophy is lacking because of the absence of a confining capsule.

Dr. Edwin H. Place, of the Boston City Hospital, defended scarlet-fever immunization. He stated that it does prevent the disease if properly used and that the main question concerns the prevention of toxic manifestations when the bacteria are unaffected. The complications of the latter can be minimized by adequate chemotherapy. Dr. Place decried the illogical practice of immunizing the medical profession and children in asylums and then allowing those on the fringe to go unprotected. He stated that the danger of immunization is highly overrated and that it must be classed merely as an unpleasant procedure.

Dr. Place warned against smallpox vaccination in dermatitis except in emergencies, because of the danger of eczema vaccinata. Although dressings are inadvisable over vaccinations according to public-health authorities, Dr. Place stated that proper light dressings prevent spread of the vaccine and the development of secondary infection.

Dr. Stimson closed the discussion with the observation that nurses may need as many as ten injections of toxin to get a permanently negative Dick test. He warned against diagnosing rubella except in epidemics and urged the discarding of the confusing name of "German measles." In regard to the development of severe diphtheria in posttonsillectomy cases,—a rare danger,—he urged that the surgeon know the patient's state of immunity to diphtheria to be sure that he is not operating on a susceptible carrier.

NOTICES

ANNOUNCEMENT

Clifford C. Franseen, M.D., announces the removal of his office from 195 Pilgrim Road, Boston, to 1101 Beacon Street, Brookline.

NEW ENGLAND SOCIETY OF ANESTHESIOLOGY

The February meeting of the New England Society of Anesthesiology will be held in the Dowling Surgical Building, Boston City Hospital, on Tuesday, February 11, at 8 p.m.

Program

Rectal Evipal. Dr. H. B. MacEwen.
Anesthesia for Ludwig's Angina. Dr. P. Marcus.

NEW ENGLAND HOSPITAL FOR WOMEN AND CHILDREN

The monthly clinical conference and staff meeting of the New England Hospital for Women and Children will be held on Thursday, February 6, at 7:15 p.m. in the classroom of the nurses' residence. Dr. Z. Eileen Taylor will speak on "Coagulation Defect of Menstrual Blood."

BOSTON SOCIETY OF BIOLOGISTS

There will be a meeting of the Boston Society of Biologists on Wednesday, February 19, in the lecture room, Eastman Building, East Wing, Massachusetts Institute of Technology, at 8 p.m. Dinner will be served in the Silver Room, Walker Memorial Building, at 7 p.m.

PROGRAM

A New Projection Oscillograph for the Observation of Electrical Potentials in Tissues. Dr. J. Warren Horton.

Proliferation-Promoting Factors (Wound Hormones) from Injured Cells. Dr. John R. Loofbourow.

Physiologic Effect of Decreased Body Temperature in Human Beings. Dr. John H. Talbott.

HARVARD MEDICAL SOCIETY

There will be a meeting of the Harvard Medical Society on Tuesday, February 11, in the amphitheater of the Peter Bent Brigham Hospital at 8:15 p.m. Dr. Soma Weiss will preside.

PROGRAM

Presentation of cases.

Pneumonia. Dr. Maxwell Finland.

Beginning with the February 11 meeting, the Harvard Medical Society will meet on the second Tuesday of each month rather than bimonthly as in the past.

ROBERT BRECK BRIGHAM HOSPITAL

There will be a staff meeting of the Robert Breck Brigham Hospital on Tuesday, February 11, in the hospital, 125 Parker Hill Avenue, Boston, at 7:45 p.m.

PROGRAM

The Present Status of Physiotherapy in the Treatment of Chronic Arthritis. Dr. Arthur L. Watkins. Discussion by Drs. Robert B. Osgood and Hallowell Davis.

Physicians and medical students are cordially invited to attend.

WALTHAM MEDICAL MEETING

There will be a clinicopathological staff conference of the Metropolitan State Hospital on Thursday, February 6, at 8 p.m. A case of amyotrophic lateral sclerosis will be presented by Drs. Clementine McKeon and Richard C. Wadsworth. It will be discussed by Dr. James B. Ayer.

All interested physicians are cordially invited to attend.

FELLOWSHIP OPPORTUNITIES

A limited number of fellowships have been provided by The Commonwealth Fund and other sources for extramural training in psychiatry, especially that of children. These fellowships are to be administered by the National Committee for Mental Hygiene, through whom fellows are to be assigned for one or two years to a selected child guidance clinic, the term and plan of the fellowship to be determined by the peculiar needs of the fellows. Candidates for fellowship should have had at least two years of psychiatry in an approved mental hospital, in addition to other qualities fitting them for extramural service. These fellowships come in response to a definite paucity of personnel in this field. Accordingly, other conditions, such as age, sex and marital status, must be governed by individual cases and by the nature of current demand. Requests for further information about these fellowships, and applications therefor, should be addressed to Dr. Milton E. Kirkpatrick, National Committee for Mental Hygiene, Room 916, 1790 Broadway, New York City.

ELLA SACHS PLOTZ FOUNDATION

During the seventeenth year of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation, eighty-one applications for grants were received by the trustees, fifty-one of which came from the United States, the other thirty coming from fifteen different countries in Europe, Asia, North and South America. The total number of grants made during this year was twenty-three, one of these being a continued annual grant.

In the seventeen years of its existence the Foundation has made three hundred and ninety-four grants which have been distributed to investigators in Arabia, Argentina, Austria, Belgium, Brazil, Canada, Chile, China, Czechoslovakia, Denmark, Egypt, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, India, Iraq, Italy, Latvia, Lebanon, Netherlands, North Africa, Norway, Palestine, Poland, Portugal, Roumania, South Africa, Sweden, Switzerland, Syria, Venezuela, Yugoslavia and the United States.

In their first statement regarding the purposes for which the fund would be used, the trustees expressed themselves as follows:

> For the present, researches will be favored that are directed toward the solution of problems in medicine and surgery or in branches of science bearing on medicine and surgery.
>
> As a rule, preference will be given to researches on a single problem or on closely allied problems; it is hoped that investigators in this and in other countries may be found, whose work on similar or related problems may be assisted so that more rapid progress may be made possible.
>
> Grants may be used for the purchase of apparatus and supplies that are needed for special investigations, and for the payment of unusual expenses incident to such investigations, including technical assistance, but not for providing apparatus or materials which are ordinarily a part of laboratory equipment. Stipends for the support of investigators will be granted only under exceptional circumstances.

In the past few years the policy outlined in the second paragraph has been neglected. During the present great need for funds, grants will be given in the sciences closely related to medicine without reference to special fields. The maximum size of grants will usually be less than $500.

Applications for grants to be held during the year 1941–1942 must be in the hands of the Executive Committee before April, 1941. There are no formal application blanks, but letters asking for aid must state definitely the qualifications of the investigator, an accurate description of the research, the size of the grant requested and the specific use of the money to be expended. In their requests for aid, applicants should state whether or not they have approached other foundations for financial assistance. It is highly desirable to include letters of recommendation from the directors of the departments in which the work is to be done. Only applications complying with the above conditions will be considered.

Applications should be sent to Dr. Joseph C. Aub, Collis P. Huntington Memorial Hospital, 695 Huntington Avenue, Boston, Massachusetts, U. S. A.

SOCIETY MEETINGS AND CONFERENCES

Calendar of Boston District for the Week Beginning Sunday, February 2

Sunday, February 2

†4 p.m. Modern Advances in Surgery. Dr. Oliver W. Cope. Free public lecture. Harvard Medical School, Building D.

†4 p.m. Present-Day Obstetric Practice. Dr. Alonzo K. Paine. Public health lecture. Cambridge Hospital, Margaret Jewett Hall.

Monday, February 3

12:15–1:15 p.m. Clinicopathological conference. Peter Bent Brigham Hospital amphitheater.

Tuesday, February 4

12:15–1:15 p.m. Clinicoroentgenological conference. Peter Bent Brigham Hospital amphitheater.

8:15 p.m. Experimental and Therapeutic Researches on Snake Venoms. Dr. David I. Macht. Greater Boston Medical Society. Beth Israel Hospital auditorium.

Wednesday, February 5

*12 m. Clinicopathological conference. Children's Hospital.

*2–4 p.m. The Unconscious Patient. Drs. E. C. Cutler and Soma Weiss. Peter Bent Brigham Hospital.

Thursday, February 6

*8:30 a.m. Combined clinic of the medical, surgical, orthopedic and pediatric services of the Children's Hospital and the Peter Bent Brigham Hospital, at the Children's Hospital.

7:15 p.m. Coagulation Defect of Menstrual Blood. Dr. Z. Eileen Taylor. New England Hospital for Women and Children.

*Open to the medical profession.
†Open to the public.

February 5 — Wachusett Medical Society. Page 135, issue of January 16.

February 6 — Waltham Medical Meeting. Page 218.

February 11 — New England Society of Anesthesiology. Page 217.

February 11 — Harvard Medical Society. Page 218.

February 11 — Robert Breck Brigham Hospital. Page 218.

February 12 — New England Dermatological Society. Page 134, issue of January 16.

February 13 — Pentucket Association of Physicians. Page 263, issue of August 15.

February 19 — Boston Society of Biologists. Page 218.

February 20–22 — American Orthopsychiatric Association, Inc. Page 999, issue of December 12.

March 8 — American Board of Ophthalmology. Page 201, issue of August 1.

March 12–14 — New England Hospital Assembly. Hotel Statler, Boston.

March 21–22 — New York University College of Medicine, Alumni Day. Page 135, issue of January 16.

April 21–25 — American College of Physicians. Page 1065, issue of June 20.

May 21, 22 — Massachusetts Medical Society, Boston.

June 2–6 — American Medical Association. Cleveland, Ohio.

October 14–17 — American Public Health Association. Page 135, issue of January 16.

District Medical Societies

ESSEX SOUTH

February 5 — Gastric and Duodenal Ulcer: Diagnosis and treatment. Dr. Arthur Allen. Lynn Hospital.

March 5 — X-ray in Heart Disease. Dr. Merrill C. Sosman. Essex Sanatorium, Middleton.

April 2 — Pediatric Problems in General Practice. Dr. Joseph Garland. Addison Gilbert Hospital, Gloucester.

May 14 — Relation of the Doctor to the Law. Mr. Leland Powers. New Ocean House, Swampscott.

FRANKLIN

March 11.

May 13.

Meetings will be held at 11 a.m. at the Franklin County Hospital, Greenfield.

NORFOLK

February 25 — Medicolegal meeting. 8:30 p.m. Hotel Puritan, Boston.

March 25 — To be announced.

May 8 — Censors' meeting. Hotel Puritan.

SUFFOLK

April 30 — Page 604, issue of October 10.

WORCESTER

February 12 — Worcester State Hospital, Worcester.

March 12 — Memorial Hospital, Worcester.

April 9 — Hahnemann Hospital, Worcester.

Supper at 6:30 p.m. followed by a business meeting and scientific program.

BOOK REVIEWS

Physical Diagnosis. By William Nance Anderson, M.D. 8°, cloth, 424 pp., with 92 illustrations. Philadelphia: Lea & Febiger, 1940. $4.75.

It is interesting that a field like that of physical diagnosis, in which so very little is going on, should continue to produce such an abundance of modern textbooks. There is always someone eager to tell us once again the old familiar story of Williams's tracheal tone, of Gerhardt's sign, of Traube's semilunar space and of Litten's phenomenon, and to give us the newest slant on skodaic tympany.

Most of these books are too big. All that a student of physical diagnosis need know could easily be contained in a pocket manual of less than two hundred pages. If such authors were entirely realistic, they would show the student how to hold his fingers and properly elicit the note of pulmonary resonance, then confide to him the secret that, if one really wants to know whether a patient has pulmonary tuberculosis, the chest is x-rayed.

The author of a manual of physical diagnosis has a few definite obligations to the students who receive their elementary instruction from his text. He should accurately describe the fundamental methods of procedure and should present a few facts in clear and systematic illustration of the results to be obtained through their use. The content of Dr. Anderson's book is adequate, and his method of presentation is reasonably good. The grammatical construction, however, leaves a good deal to be desired, and such gross errors as "Siedlitz" powder, "Rhefus" tube, "herz buckle" and "decubital" artery should not have escaped the proofreader. In all good will it must be said that, although the book should not be condemned, there are half a dozen others on the same subject that are at least its equal. A free use of the editorial blue pencil and the addition of a greater number of illustrations would enhance its appeal.

Psychological and Neurological Definitions and the Unconscious. By Samuel Kahn, M.D., Ph.D. 8°, cloth, 219 pp. Boston: Meador Publishing Company, 1940. $2.00.

This interesting little volume, dedicated to the memory of Sigmund Freud, is a combined psychological dictionary and discussion of the theories of the unconscious and the development of psychoanalysis. It is not exhaustive; only a few of the outstanding psychological theories and conceptions are discussed, but these are pre-eminently of a psychoanalytic nature. The definitions comprise psychological, psychiatric, psychoanalytic and neurological terms.

The chapters give in turn the history of psychoanalysis, the biography of Freud, the philosophy of the unconscious, its psychoanalytic point of view, and various speculations on unconscious activities. One feature is the author's insistence on a fact that analysts have long emphasized and that has led to the development of training institutes; namely, that a personal or preparatory analysis is necessary before one can successfully practice analytic therapy.

The last chapter of the book comprises an extensive bibliography on psychoanalysis, mental hygiene and educational psychology.

An Index of Treatment. By various authors. Edited by Sir Robert Hutchison, Bart., M.D., LL.D., F.R.C.P., assisted by Reginald Hilton, M.A., M.D., F.R.C.P. Twelfth edition, revised. 8°, cloth, 996 pp., with 148 illustrations. Baltimore: Williams & Wilkins Company, 1940. $12.00.

This is a standard British reference work. Its popularity may be judged from the fact that the book is now in its twelfth edition since it first appeared in 1907. It had gone through six editions by 1911. The editor, Sir Robert Hutchison, is president of the Royal College of Physicians. There are about seventy-five contributors, all of them British. They include such eminent figures as W. Russell Brain, J. P. Lockhart-Mummery, P. H. Manson-Bahr and Thomas A. Ross. Yet this book has been little used in this country, no recent edition being found, for example, in the Boston Medical Library.

The preface states: "The whole book has again been thoroughly revised and some of the articles entirely rewritten." However, one suspects that revision has been less than complete. For example, although the article on pneumonia does carry one short paragraph on sulfapyridine (mentioned only as M.&B. 693), it still includes a long section, headed "To combat toxemia and septicemia," that discusses bleeding, diaphoresis, catharsis and diuresis. The section heading has the following curious footnote: "This section is partly traditional and some of the methods mentioned are probably becoming obsolete." The article on tabes dorsalis still recommends Pyramidon for tabetic pains. In the treatment of tapeworm and roundworm infestation, there is no mention of carbon tetrachloride, tetrachlorethylene or hexylresorcinol.

The book is written, of course, for English use, and many of the proprietary preparations mentioned are limited to that country, as are some of the methods and ways of life discussed. For the most part, however, the text has been brought up to date; the articles are brief and concise, and the book will undoubtedly be of much aid to the general practitioner and student.

Clinical Methods: A guide to the practical study of medicine. By Sir Robert Hutchison, Bart., M.D., LL.D., F.R.C.P., and Donald Hunter, M.D., F.R.C.P. Eleventh edition. 16°, cloth, 622 pp., with 19 color and 8 half-tone plates and 106 figures. New York: Paul B. Hoeber, Inc., 1940. $5.00.

The eleventh edition of Hutchison and Hunter, the fat, little British equivalent of Seiffert and Mueller, has been reduced to a mere six hundred and twenty-two pages. It is a complete manual of clinical diagnostic procedures, many of them obsolete, from the "examination of vomit" to tables of conversion from imperial weights and measures to "milligrammes" and "centimetres."

The difficulty with imported texts is that no matter how great their time-honored and deserved popularity in the land of their origin, their abundant data do not correspond to American needs. We do not use the Mackenzie–Lewis polygraph, to the description and use of which ten pages are devoted; nor are Gowers's, Haldane's and Oliver's hemoglobinometers, covered in four pages, or Gerrard's hypobromite ureometer, illustrated by a woodcut engraved in 1895, to be found in our hospital laboratories. MacLean's method of estimating sugar in the blood, his urea-concentration test, and the Jenner, Leishman and Ehrlich tri-acid stains are not in general clinical use in this country. Many other examples might be cited. Any one of the several American house-officers' handbooks that contain information of contemporary value is preferable to even a revised edition of this respected and admirable volume.

Child Care and Training. By Marion L. Faegre and John E. Anderson. Fifth edition, revised. 8°, cloth, 320 pp., with 29 illustrations and 3 tables. Minneapolis: University of Minnesota Press, 1940. $2.50.

This is one of the best of the home manuals on child care and management—one that can be recommended enthusiastically and without reservation. Its primary aim is to provide a sound and adequate psychological basis for understanding the child, without which all education is indeed futile. And this it does admirably. But the book is by no means restricted to generalities; it answers scores of specific questions about habit formation, learning, family relationships, growing, eating, sleeping, discipline, play, sex education and even the common contagious diseases. Moreover, for the reader who wishes to pursue his inquiries further there are bibliographies at the ends of the several chapters, and there are tables of questions adaptable for classroom use or round-table discussions. One can wish for this book a still wider sphere of usefulness.

Sulfanilamide, Sulfapyridine and Allied Compounds in Infections. By Maurice A. Schnitker, M.D. Edited by Henry A. Christian, A.M., M.D., LL.D., Sc.D. (Hon.), Hon. F.R.C.P. (Can.). 8°, cloth, 72 pp., with 4 illustrations. New York: Oxford University Press, 1940. $1.50.

The chemotherapy of infections with drugs of the sulfonamide group is a field so new, so vast and so rapidly advancing that it is difficult for the practitioner to assimilate the newer knowledge of this subject and to keep up with its progress.

This small, compact book—reprinted from *Oxford Loose-Leaf Medicine*—will be found tremendously helpful and informative. It reviews the pharmacology, action and methods of administering sulfanilamide and sulfapyridine, the particular infections in which each is or is not effective, the toxic effects and the methods of determining the drugs in the blood, urine and body fluids. The information and directions are so detailed that reference to any other source is unnecessary. The author discusses briefly a few other related compounds, but not recently developed ones, such as sulfathiazole. There is an exhaustive bibliography, and a foreword by Dr. Henry A. Christian.

It Is Your Life: Keep healthy, stay young, live long. By Max M. Rosenberg, M.D. 8°, cloth, 450 pp. New York: The Scholastic Book Press, 1940. $2.50.

The idea of this book had its origin in the author's occasional practice of distributing to his patients printed folders on the preservation of health and the prevention of disease. The work covers a wide range of subjects and is written in an easy style. Although on the whole the text may serve to teach and guide the average person in his daily mode of living, it should be pointed out that the author frequently presents his material in the spirit of excathedral pronouncement, and that certainly at times he oversteps his experience and discrimination on matters which could be left to those better equipped to pass final judgment.